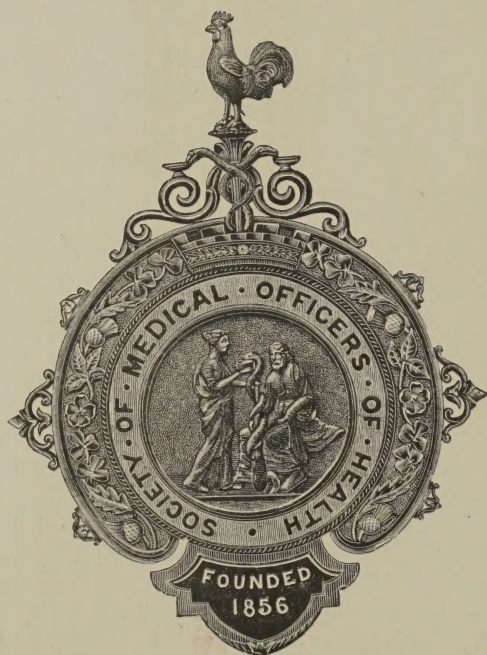


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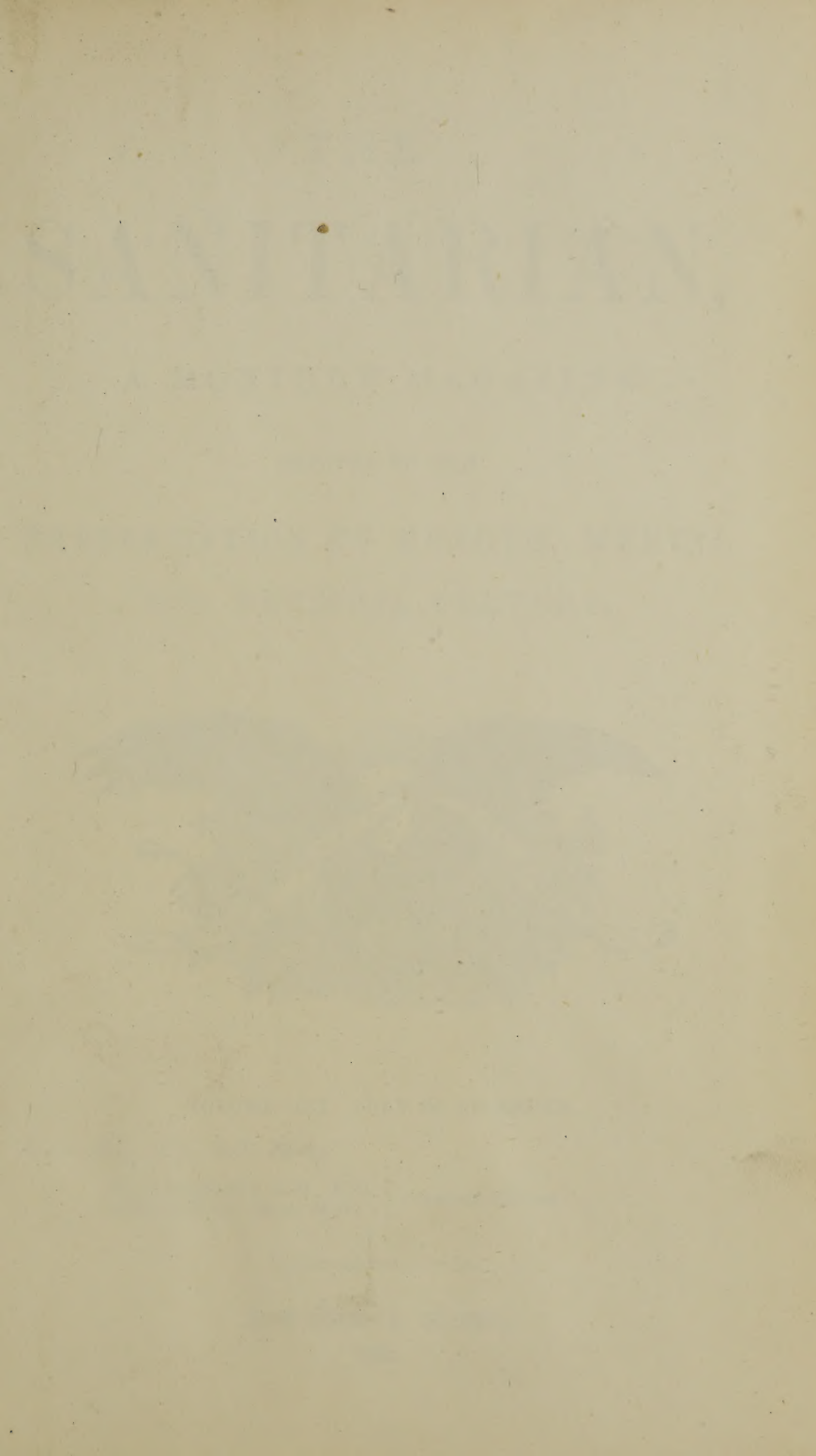
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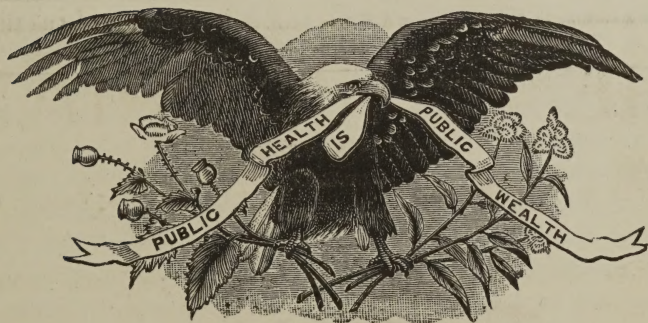
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THE SANITARIAN,

A MONTHLY MAGAZINE

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PRESERVATION OF HEALTH, MENTAL
AND PHYSICAL CULTURE.



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THE SANITARIAN.

JULY, 1888.

NUMBER 224.

THE EXAMINATION OF DRINKING WATER.

READ BEFORE THE NORFOLK DISTRICT OF THE MASSACHUSETTS MEDICAL SOCIETY, NOVEMBER 29TH, 1887.

By J. A. TANNER, M.D., Boston, Mass.

IT is not my intention to discuss minutely the various methods for examining drinking water, or to attempt to point out any general or special procedure for examining and keeping pure the water supplies of cities, as the length of an article embracing such questions would be too great for this occasion. In view of the great hygienic importance of a supply of good drinking water, and the implicit confidence placed by many in the chemical examinations for the organic impurities in water, it will not be out of place to give a short criticism upon the value of these examinations in order that as physicians, not as chemists, we may form an idea of the ground we are walking upon when relying upon the reports based on such examinations.

Considering the multiplication of the sources producing waste products of a suspicious character, and the large increase of natural pollutions which tend to render impure the water supply of large communities, the question arises whether we are in command of a method for the examination of water that will give even an approximate idea as to its wholesomeness or unwholesomeness. Accepting as established the germ theory of the cause of disease—and the points brought forward in favor of it are strong—and in that connection viewing the recognized chemical methods used in examining water, it is

proposed to demonstrate that we are relying upon data received from unreliable processes.

Even those who do not accept the germ theory, when they contrast the gross amount of organic matter recognized by the chemical methods in comparison with the infinitesimal amount of infectious matter that will produce disease must question the value of such examinations.

Probably the most delicate test in water analysis is that used to detect the presence of the nitrite salts, and this, it is claimed, will recognize the presence of one grain of nitrites in one thousand million grains of water ; but this is a *rough* test compared to that necessary to recognize the exceedingly minute amount of septic matter that will convey poison to a surgeon when he cuts his hand with a septic scalpel, or the syphilitic poison conveyed by the end of a cigar when the cigar has been rolled by a maker so diseased, who moistens his fingers with saliva when twisting the end. Again, the various infectious diseases carried by means of the air will pollute the water when this air is absorbed by it ; and as chemical examinations do not *recognize* this infectious matter in the *air*, it is not to be expected that they will detect it in *water*. It must be admitted that chemical processes will point out the presence of gross pollution and thereby give warning that the water may produce disease, but they do not give a definite idea as to the *character* of the organic matter entering into the pollution, nor do they tell us whether the matter is of that nature which will certainly produce disease under favorable circumstances ; they do not recognize the difference between organic substances of a harmless nature and those of a highly dangerous character, though present in considerable quantities ; and the processes will even pass by dangerous matter if present in *small* quantities. The *quality* of the pollution is the essential knowledge sought, not the quantity. Taking the processes generally recognized as giving reliable information—the Frankland or Combustion process, the Wanklyn or Albuminoid process, and the Tidy or Permanganate process—and examining them in reference to the data furnished as to the potability of a water, it will be seen that it is entirely too meagre for definite work when applied to classifying, as to character, the organic matter that may be present.

To impress the idea to be conveyed, an illustration will be given. Suppose to a gallon of distilled water is added 5% of milk or any beef extract, and then this harmless solution is submitted to chemical examination ; the processes will condemn it as impure. Allow such a mixture to stand until the organic matter is decomposing, so as to render the water *dangerous*, and then examine it *again* ; it will be condemned as in the first place. The data obtained from the two examinations will not be sufficiently different to point out any special difference between the two specimens, and in all probability the last examination will not condemn the specimen in terms as strong as the first did. The combustion process tells us that there is a certain amount of carbon and nitrogen present, and feebly attempts to classify the organic matter according to the ratio in which the carbon and nitrogen are found. The ammonia process, according to the presence of free ammonia and albuminoid ammonia, endeavors to name the character of the water pollution. The oxygen process relies simply upon the rapidity with which oxygen is taken up by the organic matter, in order to determine its character. If we will now invade the laboratory of the bacteriologist and manage to capture a few millions of some disease-producing bacteria, and add them to a gallon of distilled water, we will have, according to the germ theory, a *highly dangerous* mixture, but the chemical examination will pronounce this good, simply because there will not be sufficient organic matter present for the process to grasp and take notice of. Add a little fresh and innocent milk to this same water, and the processes will then condemn it, not on account of the bacteria present, but because of the organic matter contained in the milk. Passing by a discussion of the sources of inaccuracy due to the reagents, and the manipulations necessary in these processes, when we come to look at the arbitrary standard of classification, then the chances for error must be noted ; for we find the lines are drawn so closely that even, admitting the methods to be accurate in entity, from a very slight error in manipulation a water that is pure may be classed as impure, and *vice versa*. The permanganate process classifies a water according to the amount of oxygen that is required in oxidizing the organic matter present, say in one hundred thousand parts of water, as follows : A water re-

TABLE I.
"NATURAL WATERS BELIEVED FROM ACTUAL USE TO BE OF GOOD, WHOLESOME CHARACTER."

No.	Specimen.	Combustion Process.	Ammonia Process.	Permanganate Process.	Nitrites.	Nitrates.	Chlorine.	Odor.	Color.	Turbidity.
1	Rain water stored in an iron tank, New Orleans, La.....	Doubtful.	Fair.	Doubtful.	Trace.	.500	1.700	None.	Yellowish.	Slight.
2	Water from deep artesian well, Charleston, S. C. June 25th.....	"	Good.	Medium.	.368	None.	130.000	"	Slightly yel'w	"
3	Same, second sample. Sept. 8th	"	"	"	None.	Trace.	126.000	"	"	"
4	Same, from a hydrant after passing the reservoir. Sept. 9th.....	Impure.	"	Doubtful.	Trace.	"	126.000	"	"	"
5	Pure spring water supplying University of Va. directly from spring above level of reservoir.	Great or purity	"	Great or purity	None.	"	.750	"	Blue.	"
6	Water from hydrant in chemical laboratory, University of Va.....	"	"	"	.184	None.	1.000	"	Yellowish.	"
7	Second sample from same source as above.....	"	"	"	None.	"	.670	"	Brownish yel.	"
8	Third sample taken just after rain succeeding long drought.....	"	"	"	.004	"	1.330	"	Yellowish.	Turbid.
9	Well water from well attached to janitor's house, University of Va. Aug. 20th.....	"	Good.	"	Trace.	1.040	3.750	"	Blue.	Slightly t'rb'd
10	Second sample from the well. Oct. 3d.....	Medium.	"	Medium.	None.	1.060	2.250	"	"	"
11	Cocuttuate water supply of Boston, Mass. Sept. 7th.....	Impure.	Bad.	Impure.	Trace.	Trace.	3.600	"	Greenish yellow.	"
12	Croton water supply of New York City. July 25th.....	Doubtful.	Fair.	"	.018	"	.670	"	Yellowish.	"
13	Lake Roland water supply of Baltimore, Md. July 22d.....	Medium.	Good.	Medium.	Trace.	.370	2.330	"	"	Somewhat turbid.
14	Schuylkill water supply of Philadelphia. Aug. 31st.....	"	Bad.	"	"	.220	.000	"	"	Slightly t'rb'd
15	Potomac water supply, Washington, D. C. Aug. 19th.....	"	Good.	"	"	.230	1.100	"	"	Turbid.
16	James River water supply, Richmond, Va. July 15th.....	Great or purity	Fair.	"	Trace.	Trace.	1.170	"	"	"
17	Mississippi River water supply, New Orleans, from upper reservoir. June 30th.....	Impure.	Bad.	Impure.	None.	.080	14.500	"	"	Very turbid.
18	Second sample received directly from river into pipes without passing through reservoir. July 4th.....	Doubtful.	"	"	"	"	14.300	"	"	"
19	Lake Michigan water supply of Chicago, Ill. Oct. 12th.....	Great or purity	Good.	Great or purity	"	Trace.	2.000	"	Blue.	Slightly t'rb'd.

quiring from .05 to .15 of part of oxygen per 100,000 is of medium purity ; a water requiring from .15 to .21 of part of oxygen per 100,000 is of doubtful purity ; a water requiring over .21 of part of oxygen per 100,000 is impure. Up to .21 part per 100,000 parts of water classifies the specimen as doubtful, but one that may be used ; if more than the .21 part of oxygen is used, the water is unfit for use. In other words, the organic matter in a gallon (imperial) of water should not consume more than the .15 of a grain of oxygen ; the error of the fraction of the .01 of a grain will condemn it ; what a slight inaccuracy from manipulation or other causes will change the classification !

In the ammonia process, albuminoid ammonia present in a water up to .10 of part per 1,000,000 is suspicious ; if present beyond the .15 of part per 1,000,000 condemns it ; the difference of .05 of a grain of ammonia present in 1,000,000 grains of water must be recognized. These small amounts must be noted by means of colorimetric analysis, and considering that the figures obtained from small quantities of the water are then multiplied for the estimate to 100,000 or 1,000,000 parts, a small error may become a large one, especially in the case of the permanganate process. The combustion process is not referred to under this head, because the illustrations given apply to it, and time will be saved by passing it. A discussion of such a question from theoretical points alone lacks that element of stability it would possess if based upon practical experiments ; hence, in support of the views expressed, a number of actual examinations will be reviewed. For this purpose the examinations should be those made by the three processes upon the same water at the same time ; hence free use will be made of Professor J. W. Mallet's report upon the investigation of the chemical methods for the examination of drinking water, as carried out under his charge for the National Board of Health during the year 1881. This report is used simply because it is the only organized comparative work of the kind that has been carried out on an extensive scale, the work being so arranged that the samples of water were examined simultaneously, and all bias on the part of the chemists in charge of the processes was entirely eliminated.

The writer was in charge of one of the processes throughout

TABLE 2.

"NATURAL WATERS WHICH THERE SEEMS TO BE FAIR GROUND FOR BELIEVING HAVE ACTUALLY CAUSED DISEASE ON THE PART OF THOSE DRINKING THEM."

No.	Specimen.	Combustion Process.	Ammonia Process.	Permanganate Process.	Nitrites.	Nitrates.	Chlorine.	Odor.	Color.	Turbidity.
1	Water of public spring, Harrisonburg, Va. (typhoid-fever).....	Medium.	Bad.	Great or purity	.184	5.060	4.00	None.	Yellowish.	Very slight turbidity.
2	Water from driven wells, Titusville, Pa. (typhoid-fever).....	"	Good.	Medium.	.055	1.130	4.00	"	"	Clear.
3	Water from a shallow well, Mariner's Harbor, Staten Island (acute malarial-fever).....	Impure.	Bad.	Impure.	.042	4.678	202.00	"	"	Slight turbidity.
4	Lake Champlain water supply of Burlington, Vt. (diarrheal affection).....	Medium.	Good.	Medium.	None.	Trace.	.70	"	"	"
5	Well water from near Fairfax C.H., Va. (typhus-ritic).....	Great or purity	"	Great or purity	.037	1.123	2.00	"	"	"
6	Well water from near Andover, Mass. (diphtheria).....	Medium.	"	"	None.	6.790	46.60	"	Blue.	Clear.
7	Mississippi River water supply of Rock Island, Ill. (diarrhoea).....	Impure.	Bad.	Impure.	"	Trace.	1.00	"	Greenish yellow	Slightly turbid.
8	Well water from Little Rock, Ill. (choleraic disease).....	"	Good.	Great or purity	.037	28.403	93.00	"	Blue.	Clear.
9	Well water from near Wellesville, O. (typhoid)	Medium.	Doubtful.	Medium.	Trace.	6.610	20.30	"	"	Slightly turbid.
10	Well water from Mt. Vernon, O. (typhoid)...	"	Fair.	Great or purity	None.	24.990	79.00	"	Faint yellow.	"
11	Well water from Jonesville, Mich. (typhoid).....	Impure.	Bad.	Impure.	.276	3.164	7.50	"	Purplish.	"
12	Well water from near Adamstown, Mich. (typhoid).....	Doubtful.	"	Medium.	.040	8.740	41.50	Slight stale.	Yellowish.	"
13	Water from City Park well, Charlotte, Mich. (typhoid and diph.).....	Medium.	Fair.	Great or purity	None.	7.060	7.50	None.	Blue.	Clear.
14	Water from rear of public house, Charlotte, Mich. (intestinal disease).....	Impure.	Bad.	Medium.	1.288	26.402	86.00	"	Faintly yellow.	Very slightly turbid.
15	Well water from Jacksonsville, Fla. (typhoid and remittent of obstinate type).....	Medium.	"	"	.018	4.342	28.00	"	Yellowish.	Slightly turbid.
16	Water from a "driven well," Asbury Park, N. J. (diphtheria).....	Great or purity	"	Great or purity	.033	8.507	66.00	"	Blue.	Very slightly turbid
17	Well water from Huntington, Pa. (typhoid)...	Doubtful.	Suspicious.	Medium.	.029	15.961	106.00	"	Yellowish.	"
18	Water from a shallow well, Meridian, Miss. (typhoid and dysentery).....	Condemned.	Good.	Great or purity	.004	8.496	56.00	"	Blue.	Slightly turbid.
19	Well water from Lexington, Mich. (typhoid)...	Impure.	Doubtful.	Doubtful.	.011	3.239	18.70	"	Yellowish.	Very slightly turbid

the investigation. It will not be necessary for a review of all the samples, especially as the results from a few of the waters examined will be sufficient to illustrate the want of agreement in the processes, and amount of faith to be placed in these examinations. The following tables of reports are from the examination of four classes of waters.

The first table contains reports upon nineteen samples of "Natural waters believed from actual use to be of good, wholesome character." This list embraces samples of the water supplies of several large cities, and also waters from springs and wells; the specimens were selected as types of good waters. An inspection of the table shows that the reports from the three processes are quite out of harmony, for while they deem ten samples potable, and agree in condemning three, in six there was no concurrence of report.

In table No. 2 there are reports upon nineteen samples of "Natural waters which there seems to be fair grounds for believing have actually caused disease." The samples in this table were carefully selected, after full inspection of the grounds of suspicion, as waters of a dangerous character. Six of these were passed as wholesome, four were pronounced unwholesome, and in nine there was no agreement.

In the third table are reports upon twenty samples of "Natural waters of doubtful but more or less suspected character." The histories of the waters in this class did not tend to suspicion clearly enough to place them in the dangerous list. The reports accept five, reject six, and disagree in nine. According to the processes, the waters in this suspected class are more to be condemned than those classed as dangerous.

Table 4 gives the reports upon twenty samples of artificially prepared waters, made by adding various pollutions to good wholesome water. The pollutions added were as follows: Sewage from several sources, semi-fluid dejecta from typhoid-fever patients, "black vomit" from yellow-fever patient, etc. Three of these samples were pronounced good, eight were condemned, while in nine the reports did not agree.

Contrasting the reports as to agreement in tabular form, it is surprising to note the slight difference in the four classes of waters as to the number accepted, condemned, etc.

TABLE 3.
NATURAL WATERS OF DOUBTFUL BUT MORE OR LESS SUSPECTED CHARACTER.

No.	Specimen.	Combustion Process.	Ammonia Process.	Permanganate Process.	Nitrites.	Nitrates.	Chlorine.	Odor.	Color.	Turbidity.
1	Well water from Port Chester, N. Y.	Doubtful.	Fair.	Great or purity	.002	7.038	20.000	None.	Blue.	Clear.
2	Well water from Closter, N. J.	Great or purity	Good.	" "	Trace.	2.830	5.000	"	"	"
3	Well water from near Kipley, Mass.	Doubtful.	"	Medium.	None.	Trace.	132.000	"	Faintly yellow.	Turbid.
4	Well water from Union City, Tenn.	"	"	"	"	13.050	"	"	Yellowish.	Slightly turbid.
5	Hudson River water, supply of Poughkeepsie, N. Y.	Medium.	Fair.	"	Trace.	Trace.	4.500	"	"	"
6	Trinity River water from Dallas, Tex.	Impure.	Bad.	Doubtful.	None.	.470	13.500	"	"	Turbid.
7	Water from a small brook at Bordentown, N. J.	"	Foul.	Impure.	"	None.	9.300	As of stale cist'rn water.	"	"
8	Crosswick's Creek water supply of Bordentown, N. J.	Doubtful.	Fair.	"	.005	Trace.	2.330	None.	"	Slightly turbid.
9	Public water supply (wells) of Titusville, Pa. .	Great or purity	Good.	Great or purity	None.	.480	2.500	"	Blue.	Clear.
10	Occasional water supply (from Oil Creek) of Titusville, Pa.	Doubtful.	Fair.	Impure.	"	None.	.750	"	Yellowish.	Slightly turbid.
11	Well water from Newport, R. I. (unfiltered). .	"	Good.	Great or purity	.000	30.361	108.000	"	Blue.	Clear.
12	Same water from Newport (filtered).	Impure.	"	"	.026	31.312	112.000	Very slt. un-p's'nt	"	Very sl. turbid.
13	Public water supply, Newport, R. I., as used on board U. S. S. New Hampshire.	"	Foul.	Doubtful.	Trace.	Trace.	22.500	"	Yellowish.	Turbid.
14	Water from melting of ice from Almy's Pond, Newport, R. I.	Great or purity	Fair.	Great or purity	"	"	1.330	None.	Blue.	"
15	Water of Mississippi River at New Orleans, from below point where the city garbage is dumped.	Doubtful.	Bad.	Impure.	None.	"	12.000	"	Yellowish.	Very turbid.
16	Same, taken from a point half a mile below the city dumping-ground.	"	Fair.	"	"	.020	12.500	"	"	"
17	Water from the "Old Basin" canal, New Orleans, La.	Impure.	Foul.	"	"	None.	122.400	As of stale cist'rn	Yellow.	Turbid.
18	Water from the "New Basin" canal, New Orleans, La.	"	"	"	.037	"	106.000	As of stale cist'rn	"	"
19	Well water from a somewhat suspected well, University of Va.	Great or purity	Doubtful.	Great or purity	None.	15.500	31.000	None.	Blue.	Very sl. turbid.
20	Pond water exposed to pollution from a stable, near the University of Va.	Doubtful.	Bad.	Medium.	Trace.	T. .137	5.000	"	Very sl. yellow'h	Turbid.

	<i>Good.</i>	<i>Bad.</i>	<i>No Agreement.</i>	<i>Total.</i>
Table 1.....	10	3	6	19
" 2.....	6	4	9	19
" 3.....	5	6	9	20
" 4.....	3	7	10	20
	<hr/> 24	<hr/> 20	<hr/> 34	<hr/> 78

The summing up shows that in 78 samples of water, 19 of which were selected as types of wholesome water, 19 as dangerous, 20 as suspicious, and 20 that were purposely polluted, 24 were pronounced good by all the processes, 20 bad, and 34 could not be agreed upon. The question naturally arises whether one process is more to be relied upon than the others, and whether all processes should be shelved because of their disagreement; from the following table, giving the reports of each process separately as to the number of specimens respectively pronounced potable and non-potable in each class, it appears that the ammonia process is the most reliable, but the showing is not favorable enough to call for very much confidence in it even.

COMBUSTION PROCESS. AMMONIA PROCESS. PERMANGANATE PROCESS.

	<i>Good.</i>	<i>Bad.</i>	<i>Good.</i>	<i>Bad.</i>	<i>Good.</i>	<i>Bad.</i>
Table 1....II		8	15	4	13	6
" 2....IO		9	8	11	15	4
" 3. .. 6		14	12	8	11	9
" 4....IO		10	3	17	13	7
	<hr/> 37	<hr/> 41	<hr/> 38	<hr/> 40	<hr/> 52	<hr/> 26

Special attention must be given to several of the specimens reported in Table 4. Nos. 1 and 2 are made by adding to good water $\frac{1}{5}\%$ and 1% respectively of a weak mixed sewage from a large public sewer at the University of Virginia; both specimens are reported as of "great organic purity" by the combustion process, as "good" by the ammonia process, and by the permanganate process as of "great organic purity." No. 3 contains 5% of the same sewage, and is pronounced of "medium" quality by two processes, the ammonia process condemning it as "bad." According to the present views on the cause of typhoid-fever, a water containing 1% or $\frac{1}{5}\%$ of a sewage which had received the dejecta from a typhoid-fever patient would be considered highly dangerous. Specimens 11 and 12, each containing 1% of the semi-fluid intestinal dejecta from

TABLE 4.
ARTIFICIALLY PREPARED WATERS, MADE BY ADDING TO GOOD, WHOLESOME WATER, VARIOUS POLLUTIONS.

No.	Specimen.	Combustion Process.	Ammonia Process.	Permanganate Process.	Nitrites.	Nitrates.	Chlorine.	Odor.	Color.	Turbidity.
1	Good water with $\frac{1}{8}$ of weak mixed sewage from public sewer, University of Va.	Great or purity	Good.	Great or purity	None.	Trace.	.470	None.	Yellowish.	Very sl. turbid.
2	Same as above, containing $\frac{1}{8}$ of sewage	"	"	"	"	"	None.	"	"	Slightly turbid.
3	Same, containing $\frac{5}{8}$ of sewage.	Medium.	Bad.	Medium.	"	2 .005	3.630	"	"	Turbid.
4	Water containing $\frac{1}{8}$ sewage from sewer, Richmond, Va.	"	"	Great or purity	Trace.	Trace.	None.	"	"	"
5	Same, containing $\frac{1}{8}$ of sewage, Richmond sewers.	"	"	"	"	None.	1.000	"	"	"
6	Same, containing $\frac{5}{8}$ of sewage, Richmond sewers.	Impure.	"	Medium.	.004	"	.930	Slightly stale.	"	Very turbid.
7	Water containing $\frac{1}{8}$ of sewage from sewers, Washington, D. C.	Medium.	"	"	.007	"	.300	None.	"	Turbid.
8	Same, containing $\frac{1}{8}$ of sewage.	"	"	"	None.	Trace.	None.	"	"	"
9	Same, containing $\frac{5}{8}$ of sewage.	Doubtful.	"	"	.004	"	.300	"	"	"
10	Water containing $\frac{1}{8}$ of a water in which a dead cat had been allowed to macerate.	Impure.	Foul.	Impure.	Trace.	2 .965	.320	Suggestion of faeces.	Faintly yellowish.	"
11	Water with $\frac{1}{8}$ of semi-fluid intestinal dejecta from typhoid-fever.	"	"	"	.147	None.	41.200	Strong, foul.	Yellowish.	Very turbid.
12	Water with $\frac{1}{8}$ of semi-fluid intestinal dejecta from typhoid-fever (different case from above).	"	"	"	None.	"	48.500	Foul.	"	"
13	Water with $\frac{1}{8}$ of water in which had been macerated the scurf flakes from scarlet-fever.	"	"	"	"	"	.800	Horribly offensive, causing headache, dryness of throat and nausea.	"	Turbid.
14	Water with $\frac{1}{8}$ of the "black vomit" from a fatal case of yellow-fever.	"	Very foul.	"	"	"	20 .600	Foul and very penetrating.	Faintly yellow.	"
15	Water containing $\frac{1}{8}$ water in which human faeces had been macerated.	Medium.	Bad.	Medium.	Trace.	"	None.	None.	Yellowish.	Slightly turbid.
16	Water with $\frac{1}{8}$ of refuse from a tomato-canning establishment.	Impure.	Foul.	Impure.	Faint tr.	"	.250	Strong sug. of mint.	"	Turbid.
17	Water containing $\frac{5}{8}$ of washings of a bone-black filter sugar refinery.	Medium.	Bad.	Medium.	Trace.	Trace.	.100	None.	"	"
18	Water with $\frac{1}{8}$ of alkaline washings from a starch factory.	Doubtful.	Foul.	"	None.	None.	None.	"	Blue.	"
19	Water with $\frac{1}{8}$ of drainings from a pile of pine sawdust.	Great or purity	Good.	Great or purity	"	"	"	"	Yellow.	Very sl. turbid.
20	Lake Drummond water, Dismal Swamp, Va., water supply in part of Portsmouth, Va.	Impure.	Foul.	Impure.	"	"	6.580	"	Greenish yellow	" Turbid.

No. 20 placed here because it is essentially a water of the character of No. 19, only that the process of the soaking is a natural one.

typhoid-fever patients, are interesting in this connection ; both of these were condemned as impure and foul by the chemical examinations, and they were also *condemned* by the *sensible property* of odor, which is reported as foul. A water containing 1% of such matter is grossly polluted, the odor alone condemning it, without further examination, and it is to be regretted that other mixtures containing $\frac{1}{50}$ or $\frac{1}{100}$ of 1% of the pollution had not been examined. As this was not done, the examination can be approximately reached by taking the figures given for the 1% mixture examination, and dividing by 100 ; the resulting figures pass these specimens as pure. Such an approximation assumes that the processes will as readily and in ratio recognize the organic pollution present whether in large or small amounts. Specimens 13 and 14 of table No. 4 are of interest, the first being a mixture with good water of 1% of a water in which had been macerated the scurf flakes from a scarlet-fever patient ; the second was a 1% pollution of black vomit from a fatal case of yellow-fever ; both specimens were condemned as impure and foul, but the odor *alone*, without other examination, showed them to be foul. No. 13 was "horribly offensive, causing headache, dryness of throat, and nausea," and No. 14 was "foul and very penetrating" to the smell. Applying the same idea of division so as to get the result for a pollution of $\frac{1}{100}$ of 1%, as in the samples previously referred to, both would be pronounced good. It is needless to remark that the presence of either of the pollutions in these specimens, if known to be present even in the amount of only $\frac{1}{1000}$ of 1%, would utterly condemn the water, whatever an examination would report. No. 20, Lake Drummond water, Dismal Swamp, Va., was condemned in the same terms as these highly polluted waters ; this water was used as a part of the supply for Portsmouth, Va., and has always stood in high repute with sea captains as a good water for use on long voyages. The Cochituate water supply of Boston, which in the fall season resembles the Lake Drummond water, was condemned in terms equally as strong. These waters are essentially weak infusions of vegetable matter, the Lake Drummond water receiving vegetable matter from the continual maceration of the leaves and roots of the cypress growth of the Dismal Swamp ; the Cochituate water, in the fall of the year, con-

tains vegetable matter from the soaking of the leaves that fall and float in it.

I will now speak of chemical investigation carried out under my charge of the water supply of a Western city, when about forty samples, including well and river water, were examined. The permanganate and ammonia processes were used in this work, and gave such conflicting reports with each other and the known character of the samples, the question as to the value of such examinations was forced upon me. In this investigation water from wells in close proximity to vaults sunk to the gravel strata giving water to the wells, and where the history pointed almost conclusively to pollution, was often reported as of great organic purity, while other specimens, with no general or specific history of suspicion, were condemned. Several examinations of the river water supply made at different times agreed in condemning it. Using the ammonia process alone to examine the yellow and turbid supplies of the cities on the Ohio or Mississippi rivers, in the majority of cases these supplies will be condemned as impure ; but at the same time, with two or three exceptions where climatic influences are at work, the health reports give as low as and in some cases a lower death-rate than is reported for cities having a clear water supply, which the ammonia process decides to be pure. In speaking of the chemical examination for the nitrates and nitrites, Professor Mallet remarks in his report : " Here we find a very obvious connection between the results of chemical examination and the known sanitary character of the several waters, the salts of nitrous and nitric acid being either absent or present in but trifling amounts in the waters of Class 1, believed to be wholesome, almost universally present, and in many cases in large quantity, in the pernicious waters of Class 2, and very variable as to presence and amount in the waters grouped together under the doubtful head of Class 3. No aspect in which I have compared together the good and bad natural waters has afforded so definite result as this." A reference to the tables will afford ample reason for this opinion ; and taking the examination for these salts in connection with that for chlorine, gives a nucleus for an easier and more reliable method of examining drinking waters than

either of the processes discussed. But full reliance cannot be placed even in *this* examination for the salts of chlorine, nitrous and nitric acid, for while their presence to any extent renders the water very suspicious, the absence of these salts does not insure its purity ; this is shown by the results in the table of artificially polluted waters, which does not show the presence of the nitrites, nitrates, and chlorides to any notable extent, especially in the waters polluted with such dangerous matter as typhoid-fever dejecta or black vomit.

Viewing the subject impartially, it seems we must conclude that such examinations are as apt to condemn a good water as they are to commend it, and to commend an impure water when they should condemn it ; and that we know of no chemical method by which the ethereal-like substances causing disease when in water can be grasped and recognized as present. We are at sea, with an unreliable compass to guide us.

THE HUMAN BREATH A POISON.—The Paris correspondent of the *Medical Press and Circular* reports that, at the last meeting of the Académie des Sciences, Professor Brown Sequard referred to some experiments he had conducted with a view to determine what, if any, were the toxic effects of the human breath. In condensing the watery vapor coming from the human lungs he obtained a poisonous liquid capable of producing almost immediate death. This poison is an alkaloid (organic), and not a microbe or series of microbes, as might have been imagined. He injected this liquid under the skin of a rabbit, and the effect was speedily mortal. The animal died without convulsions ; the heart and large vessels were engorged with reddish blood, contrary to what is observed after ordinary death, when the quality of blood is moderate and of dark color. In conclusion, this eminent physiologist said that it was fully proved that respired air contained a volatile toxic principle far more dangerous than the carbonic acid, which was also one of its constituents, and that the human breath, as well as that of animals, contained a highly poisonous agent.

GERMS AND DISEASE.*

By O. W. PECK, M.D., Health Officer of Oneonta, N. Y.

HAVING to deal with an outbreak of diphtheria during the past year, I became interested in the subject of germs.

The farther I pursued the subject, the more interesting I found it, and believing that something not only of interest but of profit might be present to my brethren of the Otsego County Medical Society upon this subject, which is so attractive and yet upon which the average practitioner is—I say it respectfully—so ignorant, I decided to select as the subject of my address not what is unknown but what is *known* about *germs*. Not by any means *all* or even the tithe of what is known, but some things that are known about them, not touching upon the hypothetical, however great the probabilities may be of the truthfulness of the conjectures.

At the time of our graduation, thirty years ago, what is now known as the germ theory of disease was, to all intents and purposes, unknown. It had been surmised that certain minute animals or bodies invisible to the naked eye were sometimes the cause of disease. Such guesses or assertions, based upon negative reasoning, were made and reiterated in various ways, and found more or less favor all the way along from the time of Terentius Varro, a Latin scholar, who wrote, it is said, a century before Christ, until the time of Pasteur, who first *demonstrated* the truthfulness of that which had been blindly discussed and believed or disbelieved in, as the case might be. Of course, the microscope, long waited for, revealed to the diligent searcher that which had previously been hidden, and brave men entered into the mysteries revealed and patiently investigated and sought light where before all had been darkness, or at best but dim twilight. They entered in, many of them, with the same sublime confidence in ultimate success

* Presidential Address before the Medical Society of the County of Otsego, N. Y.

that possessed Columbus as he stood upon the prow of the Pinta as she set sail for the boundless and unknown West. Thirty years ! What is now known ? It is known that germs exist everywhere. That the air is loaded with them. Not all or many of them are disease producing. That each produces its kind and *only* its kind. That the full development of the germ requires that the parent germ be perfectly developed and be planted upon a proper soil. Sow wheat, and you get wheat, never oats. Sow the germ of diphtheria, and you get diphtheria, and not small-pox. Sow wheat in the sand, and it will not germinate, or but imperfectly. Inhale the germs of diphtheria, and unless a lodgment is effected upon a surface adapted to receive it, it will not multiply. Sow an imperfectly developed germ of wheat, a grain harvested before it is ripe, and even under favorable conditions it will develop but imperfectly, if at all. The same may be said of germs, disease producing or otherwise. Not only are the effects produced by germs of a definite character governed by fixed laws, but, as would naturally be supposed, the germs themselves bear certain individual or physical characteristics, and laborers in this field have a well-defined, intelligible, and expressive nomenclature. A germ is a *seed*, as its name implies, yet a micrococcus and a bacteria have as distinct or quite as diverse characteristics as a sweet pea and poppy-seed. Dr. John S. Billings has given the name of microderms, or little living things, to the great variety of microscopic particles found in air and water under ordinary conditions. Under this term, microderms, are included microphites, or little vegetable organisms, the microzoa, or minute animals, the microzymes, or little ferments, the microbes, little lives, or microbia of Pasteur, the bacteria, etc. The minutest spherical forms of the microderms are known as micrococcus, or little grains, the short cylinders or rods, bacteria, etc. These organisms can be and are cultivated, and spherical forms produce spherical forms, and rods produce rods. It is not worth our while to set forth the arguments pro and con that were formerly used by the advocates and opponents of what was and is known as the germ theory. It is enough to say that within the last decade the labors of Cohn, Virchow, and Koch in Germany, Burden-Sanderson and Tyndall in England, and Pasteur in France, have gone far to

confirm not only the profession but the laity of the truthfulness of the germ theory. It was maintained, is now by some, we presume, that given heat, moisture, and filth in proper proportions, that disease would spring into activity *de novo*—that is, by a kind of spontaneous generation. The labors of the trained observers mentioned go to show that the factors heat, moisture, and filth furnish the conditions or environment, so to speak, that is adapted to the development of the disease-producing germs, yet no germ, no disease. A study of the germ theory is so interesting from every point, and such wonderful advances have been made in its development, that it is not an easy matter to decide where to leave it, what to say and what to leave unsaid. It would be interesting to trace its history from before the Christian era up to the present time. Slowly and with long intervals of rest, the small procession marched, its pace much quickened with the advent of the microscope, while its numbers were augmented, until during the last decade the advance of the army, in numbers, has been so rapid that few of us have been able to keep pace with it. It is quite probable that those who boldly say, "We do not believe in this germ theory and this attenuation of Koch's and Pasteur's," disbelieve simply because they are ignorant of it, and it is no evidence of the untruthfulness of the doctrine that the busy practitioner of medicine cannot always trace disease to its cause. That part of this subject relating to attenuations and inoculations is full of absorbing interest, but time and space forbid my telling what is known about it. I will, only for our profit, undertake, in the language of another, to study the development of one germ and, perhaps, if this paper is not too long and your patience not exhausted, relate some interesting facts that have been brought out in the study of germs and the practical results obtained. It may, perhaps, be well at this point to give the definition of the germ theory of disease, which is, "that certain diseases are due to the propagation in the system of minute organisms which have no share or part in its normal economy." The germs set up an action in the blood analogous to processes of fermentation that can be witnessed outside of the body. As illustrative of the theory of the development of the germ, I will, as I have said, use the language of another: "Take a portion of any vegetable—*e.g.*,

the beet or some grapes—crush them, add a little water, let the mixture stand a short time, then pour off the liquid, and you have the simplest form of vegetable infusion. Allow it to remain exposed to the air at the ordinary temperature, and shortly a change will be found to have passed over it, which is popularly called souring, but which is fermentation, and takes place as follows: the air is full of microscopic ‘germs’ or ‘spores’ or ‘cells,’ the microderms of Billings, which only need the right soil or matrix to grow or develop. Let a grain of corn remain in your coat pocket, and it will stay a grain of corn, but drop it in some fertile spot of earth, and it changes into a tall plumed spike, bearing many thousands of similar grains. The glucose of the infusion is related to these universally diffused spores just as the waiting earth is to the grain of corn, and a spore which might have stayed a spore a thousand years but for the infusion, finds its divinely appointed environment, lives its life, dies its death, and fulfils its mysterious but appointed part in the economy of nature. It is so small that it takes more than 3000 of them ranged in line to measure an inch. One spore having appropriated its infinitesimal morsel of glucose instantly becomes two; these in turn appropriate their modicum of glucose and at once double, so that by a swift progression the nature of the infusion is changed—it may be into alcohol, it may be into something with boundless powers for mischief to which science has not yet fitted a name.

“The same thing is illustrated by allowing a little beef’s blood to stand exposed to the air. An analogous change to the foregoing takes place, which is called putrefaction. In this case the albumen of the blood represents the soil. The germ that changes the fluid is bacteria. As has been remarked, the air is at all times laden with these spores, yet only when the proper conditions obtain, as illustrated by the kernel of corn, will they multiply. Of course these germs are constantly coming in contact with all substances, yet only when the predestined ones are brought together will there be development. Leave a pot of flour paste open, and it will become covered with a *greenish* mould; an old boot left in damp place with *blue* mould, and a lilac leaf in July will have spots that look like dust from the road.”

All of these—the mould—are plants produced by air-sown invisible seeds, and if not disturbed and the conditions remain favorable, will produce perfect plants and will ripen their seeds just as perfectly as any plant in the field or garden. This is not an imaginary statement, for the process can be watched under the microscope. These parasites are as dissimilar in their physical characteristics as any familiar forms of vegetation visible to the naked eye, as a potato plant and cabbage if you please.

From the foregoing an idea can be obtained as to how germicides and disinfectants produce their good results—how they *kill* the germs. (All disinfectants are not germicides.)

Time forbids an enumeration even of them—it is a subject of itself. I desire just as briefly as possible to place before you what perhaps many of you may know, some of the real practical results, we might say *commercial* results, of the patient study of germs. Two diseases which are common to men and animals, both in the highest degree contagious and fatal in their unmodified forms, will illustrate the value of these latter-day discoveries; we refer to small-pox and splenic-fever. All are familiar with vaccination and its results. Pasteur has done for animals what Jenner did for mankind. The money lost to France from the latter disease has amounted to \$4,000,000 annually. In every country of Europe it has been more or less of a scourge—528 men died of the disease in a single province in Russia in three years. Now the disease has lost its terrors through the introduction of the attenuated virus of Pasteur. Fifty healthy sheep were placed at the disposal of Pasteur; twenty-five of them he vaccinated with his attenuated virus. All recovered. A fortnight later the entire fifty were inoculated with the “most virulent splenic-fever virus.”

The twenty-five that had been vaccinated with the attenuated virus were not affected, the other twenty-five died. It is said that dust taken from pits where sheep dying of the fever were buried twelve years before produced by inoculation the disease in its most virulent forms. Pasteur discovered the spores in the casts of earth worms, and thinks they may be brought to the surface in that way. It is related that Baron Seebach, of Saxony, was a great sufferer by repeated attacks of splenic-fever in his flocks. He observed one day

that clover was growing in great luxuriance in a corner of a field where, two years before, a sheep dying of the disease had been buried. He afterward noticed that some one had stolen the clover. The next day a tenant lost a goat and had a sick cow, and acknowledged the theft of the clover.

The steps in the study of splenic-fever by which so much of practical value has been learned it is interesting to trace. In 1850 Davaine and Rayer noticed in the blood of animals which had died of splenic-fever the rod-like bodies now known as bacteria. In 1861 Pasteur published a paper on the fermentation of butric acid, and described the microscopical organisms that provoked it. Davaine read it, and conceived the idea that splenic-fever might be due to a similar fermentation in the blood of the living animals, produced by the same organisms. Subsequent studies proved such to be the fact. It was found that the rod-like organisms lost their vitality after a few weeks, which led Burton-Sanderson, in 1874, to conclude that the virus existed in two forms, "fugitive" in the rods and "latent" in some form not then determined. At this time young Koch was studying the rod-like organisms, and he found that they could be successfully cultivated. The aqueous humor of the eye of an ox he found to be an excellent field in which to cultivate them. He placed a trifle of the liquid containing the transparent rods under the microscope and watched for two hours before any change could be seen. At that time they began to lengthen, and at the end of four hours were from ten to twenty times their original length. At the end of a few hours they put out filaments hundredths of times the length of the original rods. The filaments lay lengthwise and twisted and filled the whole field of the microscope, making, in short, a luxuriant growth. Had his observations been abandoned at this point his observation would have been of little if of any practical value. Patiently continuing the watch, he saw after a time little dots appearing in them. These dots grew more and more distinct until they could be seen, microscopic ovoid bodies, lining the integument like peas in the pod. At last the integument fell to pieces and the field of the microscope was filled with seeds or spores. Here then was the "latent" form of the virus as believed to exist but not demonstrated by Burton-Sanderson.

Cohn, of Breslau, confirmed the discovery. Guinea-pigs and rabbits were inoculated with the seeds and died of splenic-fever within twenty-four hours afterward. So, then, it is shown that disease may be produced by the contagion direct or indirectly. It explains, too, how contagion clings to a locality and how under favoring circumstances and conditions it springs into light. Apples may be propagated either by cuttings, grafts, or from the seed. So with splenic-fever, the disease may be contracted at once from the rods or later from the rods having gone to seed. The results are the same but reached by different routes.

I know that much more could be said that would, I think, be instructive, yet time forbids my pursuing the subject farther. Enough has been said, however, to accomplish the purpose of this address or essay—to wit, to tell you *something* at least of what is known about germs.

DR. STERNBERG'S INVESTIGATIONS OF FREIRE'S YELLOW-FEVER GERM.

To the Editor of THE SANITARIAN :

SIR : In your notice of my investigations in Brazil last summer, in the June number of THE SANITARIAN (page 543), the statement that my investigations were made in the absence of Dr. Freire is a mistake.

I arrived in Rio, in compliance with my orders, about June 1st, and Dr. Freire returned from Europe about July 1st, bringing with him from Paris a culture of a liquefying staphylococcus, which he presented to me as his yellow-fever germ. I visited his laboratory almost daily until the date of my return (August 11th), and assisted in a series of experiments upon guinea-pigs in which he attempted to prove to me the specific pathogenic character of this micrococcus. I brought cultures of the same to Baltimore, and have cultivated it in various media during the past winter. As stated in my address before the College of Physicians (published in *The Medical News* of April 28th, 1888), "This micrococcus does not correspond in its morphology or mode of development with the *cryptococcus xanthogenicus* as described by Dr. Freire in his various published works."

In his principal work, published in 1885, Dr. Freire gives the following account of the morphology of his cryptococcus :

“ When we follow with care and attention the march of the development which characterizes the germs which produce yellow-fever, we acquire the certainty that, commencing to present themselves under the form of little points almost imperceptible, they afterward gradually increase in diameter, until they attain considerable dimensions ; so that these little beings, which, at the outset, had the aspect of very little grains of sand, not measuring more than 0.001 millimetre to 0.002 millimetre in diameter, arrive, little by little, to such a development that they reach the dimensions of 0.005, 0.007, 0.008 millimetre, and sometimes even more in certain conditions. When they have attained the adult age these cells are broken at divers points, and discharge their contents, composed of spores already formed, mixed with a viscous substance of a yellow color, composed of a pigment and protoplasmic substance, and of the liquids elaborated by the cells.”

Even so recently as last year, in an address delivered before the Dosimetrique Society of Paris, Dr. Freire repeats this account of the mode of development of his cryptococcus ; he says :

“ Each adult cell is ruptured in one or several points, and allows to escape its contents, composed of germs which are to perpetuate the species, and two pigments, one yellow, destined to infiltrate all the tissues, and to produce the icterus color which has given name to the malady ; the other, black, insoluble, and destined to be carried along by the circulatory current, producing either capillary obstructions, or blood stasis in the parenchyma of the organs.”

Now this mode of multiplication is not known among the bacteria, and does not occur in the micrococcus which Dr. Freire placed in my hands as his yellow-fever microbe, which multiplies by binary division, and does not differ in its morphology from a variety of micro-organisms of the same class, which are extremely common in all parts of the world.

According to Dr. Freire's statement, the agar culture brought by him from Paris came originally from the blood of a patient with yellow-fever at the point of death.

Now, as heretofore stated, I have demonstrated by the

microscopic examination of numerous specimens that, when proper precautions are taken, no micro-organisms are found in blood drawn from the finger of yellow-fever patients, and that no development occurs in culture media inoculated with such blood. I infer, therefore, that the micrococci, etc., found by Dr. Freire in his cultures, are due to the accidental introduction of micro-organisms from without, and especially from the surface of the finger during the collection of the blood. I may remark here that Dr. Freire's cultures in liquid media, which were made before he went to Paris, and which were placed in my hands for examination, were all impure, and contained several different micro-organisms. I suppose that the micrococcus brought back from Paris was isolated while he was there from one of these impure liquid cultures, for I found no evidence that solid culture media had been used in his laboratory in Rio prior to the date of his visit to Paris.

I have since been informed by Dr. Gibier, the French bacteriologist who was associated with Dr. Freire in Paris, that the above supposition is true, and that the micrococcus in question was isolated by him, by the plate method, from the liquid culture which Dr. Freire brought from Rio de Janeiro. In November last Dr. Gibier went to Havana for the purpose of making personal investigations, and I had the pleasure of meeting him there during my recent visit. He had expected to find the Freire microbe and to practise protective inoculations, but failed entirely to find this or any other micro-organism in the blood and tissues of yellow-fever cases.

This was the conclusion which I reached as a result of the investigations made in Havana in 1879, and is fully confirmed by my recent researches in that city. I have had ten autopsies in typical cases, and have made cultures in various media with blood drawn, as soon as possible after death, from the cavities of the heart, and with material from the interior of the liver and kidney. As a rule my cultures have remained sterile, and in no instance has there been any appearance of a micro-organism resembling the *cryptococcus xanthogenicus* of Freire or the staphylococcus which he brought from Paris and presented to me as his yellow-fever germ.

GEORGE M. STERNBERG,

Major and Surgeon U. S. A.

BALTIMORE, July 4, 1888.

ECONOMY OF HUMAN LIFE.

SINCE MALTHUS FIRST PROPOUNDED HIS DOCTRINE OF POPULATION, WHAT HAVE BEEN THE CHIEF EXPERIENCES BEARING UPON IT? SYNOPSIS OF ARGUMENT.

WHEN Malthus wrote his book on the "Pressure of Population on the Means of Subsistence," the population of England was ten millions, and in the manufactures the wages were low, and the prices of provisions were high. Take Lancashire : The wages given at the commencement of the cotton manufactures were not more than five shillings per head of the cotton mill workers, man, woman, and child ; that is to say, if there were three workers in a cottage, the aggregate wages they received were not more than fifteen shillings per week. In agriculture, in Scotland, Adam Smith states that the wages for adult workers at that period were eightpence a day. The wages now in Lancashire average 17*s.* per head of the mill workers, and in a cottage of three—man, woman, and child—the wages may amount to £2 10*s.* per week. The agricultural wages in the highly cultivated districts in Scotland are now about £1 a week for the man, six shillings for the woman, and four shillings for the boy, besides a good cottage and other advantages. In Arthur Young's time, or about the time of Malthus, the weekly wages were 7*s.* 5*d.*, and the cost of the quartern loaf was 1*s.* 4*d.* Recently the wages in the southern counties were 14*s.* 5*d.*, while in the more highly cultivated districts of the most northern counties they were about the same as in Scotland, and the price of the quartern loaf was 4*d.* Now it may be stated as an economical principle, that the fact of an artisan being employed at wages denotes that over and above his own means of subsistence, he earns enough to yield a profit to the capitalist who employs him, and the continued advance of wages denotes a continued diminution of the pressure of that population on the means of subsistence. And this has been going on, as in Lancashire, with the increasing introduction of labor-saving machinery.

At the beginning of the century, the spinning of a pound of cotton cost one shilling ; it now costs one halfpenny, and there is now paid the highest amount of wages with the lowest cost of production of any in Europe. The population in Lancashire has increased from half a million to three millions and a half, and it is going on increasing ; while the death-rate has been considerably reduced. A late Cabinet minister is reported to have stated in a recent speech : " The vast questions connected with population have to be considered. It is growing at a rate which I do not like to cite, but you know Professor Huxley's estimate. Are we taking measures to deal with that population in an intelligent and far-sighted way ? I venture to think that we are taking very few precautions, if any. And when you come to think what that question of population involves, you must see that it is one which will force itself on our attention in a very unmistakable way before long. In the first place, it forces on us the great question of the land of this country, which remains limited, while the population knows no limit to expansion." This quietly assumes the limited cost of production, and the limited amount of the production. Sir Robert Kane, in his work on the " Industrial Resources of Ireland," declares that the cultivable land of that country is capable of a threefold production greater than is now obtained from it, but that the landlords of Ireland are generally incompetent from want of skill to obtain it by labor-saving machinery. In England, it is in evidence that the labor-saving machinery in use in agriculture is not so productive by one half as the like machinery in use in the United States. And yet in England, the yield, say, of wheat, is double what it is in France or in Germany, and according to the examinations of the late Mr. Jenkins, the owner of land in *petite culture* works twice as hard for this reduced produce and for half the wages of a well-paid laborer in England. German authorities have declared that the produce there of every sort is one half what it is in England. In England, however, more than half the land that would be largely improved for profitable production by drainage is as yet undrained. Of the possible augmentation of production in England by high culture it may be stated that, while the common production is as one, the high production of market garden

culture is as three and a half, while the liquefied manure culture, as set forth by De Candolle as the future of agriculture, by giving food and water at the same time, is as five. And yet in the metropolis, prepared plans for the distribution of fresh sewage have been set aside, and the fresh sewage which would yield the milk of 200,000 cows is thrown into the river Thames in a condition of putridity, to its gross pollution.

It may be mentioned as an incident in analogy with the course of population in Lancashire, that in Norfolk, where the greatest amount of labor-saving machinery has yet been introduced, the agricultural population appears rather to have increased.

Now, in regard to the doctrine of the assumed natural check of pestilence to increase of population. In the investigation on the subject of Poor Law Relief, I found that in the healthy agricultural districts the intervals of births, where the mothers suckled their own children, was about two years, and that where there was a family of eight children, the eldest would be sixteen years of age, the second fourteen, and the third twelve, capable of earning their own subsistence. In the depressed districts, on the other hand—the slums of the metropolis, more heavily ravaged by epidemics—the intervals of births were only one year, the conceptions taking place immediately after each death. Extended experience shows that, except in such extraordinary pestilences as the Black Death, ordinary pestilences do not diminish population, but only leave it weakened. This may be exemplified from India and elsewhere. As health and the duration of life is advanced, the proportion of births appears to be rather diminished, as with the well-to-do classes. To sum up: It is shown that where wages increase, the pressure of population on the means of subsistence is diminished; that, instead of the cost of the production of land being fixed, it is generally reducible largely by science and machinery, while the amount of produce may be everywhere augmented, and that mostly in the regions of *petite culture*; that, instead of pestilence being the natural check to population, it does not diminish that pressure, but serves to weaken population and diminish its productive power, and increase the pressure of population on the means of subsistence.

I cannot descry the limits of a further advance of prosperity in this country with a further increase of population. I expect it will be found with a fifth or a fourth more of population. And then as to external relief. It is declared by a French authority that only one-sixth part is yet inhabited of the cultivable parts of the world. Mr. Justice Cunningham declares that in India "there are still seventy-nine millions of cultivable acres not utilized, and that the rate of produce might be increased so as to provide for an additional population of 400 millions." Mr. Bence Jones succeeded to an estate in Ireland when the wages were threepence a day and the rental ten shillings an acre. He advanced the wages to two shillings a day, and the valued rental to forty shillings an acre, and was proceeding to advance it still further at the time of his death. But scarcely an instance was known of a similar advance in all Ireland. In France and Germany a similar augmentation of production is proved to be practicable.

Experiences show that, with science, the biggest farm, as well as the biggest manufactory and the biggest ship, are the cheapest to work and the best for the workers, and for the prevention of the pressure of the population on the means of subsistence. Large families, with the middle classes, as a rule, stimulate exertion and enterprise, and in the districts in which there are the largest birth rates, there is the greatest amount of prosperity and the least pressure on the means of subsistence.

EDWIN CHADWICK,
Political Economy Club.

LONDON, May 11, 1888.

THE ARGENTINE REPUBLIC AND THE PROGRESS OF SANITATION THEREIN.

By T. P. CORBALLY, A.M., M.D.

THE SANITARIAN has, from time to time, given reports of the progress of sanitation in many of the States of South America. This has been suggested chiefly by the extraordinary progress, both material and intellectual, made by some of them within the last quarter of a century.

It is a strange fact that most of the South American States should be, socially and intellectually, in closer relationship with Europe than with the United States. The late commission to South America reported that : " Valparaiso is almost an English colony. The English language is used almost exclusively in trade, and the leading merchants are subjects of Great Britain, there being but three distinctively American houses in the place." " No goods are imported from the United States except when they cannot be obtained elsewhere, and then it is found much cheaper to ship them to Chili from New York *via* Hamburg or Liverpool."

Another writer states that the Argentine Republic " is said to be as enterprising, progressive, and intelligent as the United States ; it is connected with the markets of Europe by upward of twenty lines of steamships, and from forty to fifty vessels are sailing back and forth each month." More than fifty leave every month and as many enter. " Not much trade is had with the United States for lack of transportation facilities. The Argentine Republic imports from sixty to seventy million dollars worth of manufactured merchandise every year, of which about one third is furnished by England, one fifth from France and one fifth from Germany, while that of the United States is inconsiderable."

Statistics of 1883 show that " England controlled 26.2 per cent of the entire commerce and France 26 per cent, while that of the United States was but 6 per cent, as the latter country had but 2 per cent of the shipping, and that of an inferior capacity."

The Argentine Republic is nearly as large as Europe, leaving out Russia, as extensive as Canada, limiting it to Ontario and Quebec, and its capital, Buenos Ayres, has as many inhabitants as the cities of Toronto, Montreal, Quebec, and Ottawa.

The city of Buenos Ayres has all the improvements found in European capitals, all the refinements of European society—a university, National College, normal schools for males and females, museums, libraries, scientific institutions, railways, telegraphs, several daily papers, etc. The banking capital and deposits of the Republic are greater in proportion to the population than in the United States.

The population of the Republic is increasing with extra-

ordinary rapidity. Last year the immigrants numbered nearly 100,000, and of these Italians formed more than 67,000.

South American sanitarians and scientists generally are better known in Europe than are those of the United States, while here they are almost entirely unknown. Among them those of the Argentine Republic hold a very prominent place both for the actual progress made and for the enterprise and fidelity with which this progress is published for the information of foreign nations.

A distinguished member of the medical profession, Dr. Rawson, of Buenos Ayres, as representative of the Medical Association of that city, presented to the International Medical Congress of Philadelphia a very interesting essay on the "Vital Statistics of Buenos Ayres."

Dr. Emilio R. Coni has represented his country in nearly all the International Conventions held in Europe for many years, and in nearly every instance has presented interesting contributions on the vital statistics and the progress of sanitation in that country.

The Committee of Arrangements of the last International Congress held last year at Vienna invited him to attend the sessions of that body, but being prevented from assisting personally, he sent a most interesting contribution on the "Progress of Hygiene in the Argentine Republic," filling 266 pages quarto, and illustrated with 20 colored plates and maps, showing the plans of public buildings, the water supply, the sewers, schools, colleges, university, charitable institutions, hospitals, asylums for the insane, the blind, the deaf and dumb, a detailed plan of the State laboratory, and a description of the work done in it.

It also contains a plan accompanied with a detailed description of La Plata, the new capital of the Province of Buenos Ayres, which has sprung up as if by enchantment. It is called the City of Health, the first realization of the idea foreshadowed by Dr. Richardson, of London.

It also contains a map on which is marked the location of every death from cholera in 1886-87, and another showing the relation between the general mortality and that from cholera, and the meteorological conditions modifying them.

One of the most remarkable features of this publication is

that it was undertaken as a private enterprise by Dr. Coni, who applied to the authorities for permission to copy such maps and plans as were necessary to illustrate his subject, and found that his proposal was so fully appreciated that every facility was afforded him to prepare whatever he wanted ; and as the authorities deemed it a national work, they subscribed for 2000 copies in order to insure for it a wider distribution.

To further insure their greater usefulness at home and abroad, all works of this kind published by the municipality are printed in two editions—one in Spanish, the other in French—for foreign distribution. The edition here noticed was published in Paris by Baillière for the use of the Congress and others who did not understand Spanish.

The work itself is based on a report issued for the International Congress held at Geneva in 1872 by the Société de Médecine Republique de Paris, under the title “ L’Étude et les Progrès de l’hygiène en France de 1878 à 1882,” a work intended to show to the Congress the progress of hygiene during that period in France.

The first chapter of this report is devoted to the hygiene of infancy and childhood. The *first* section to the care of infants and children under two years ; the *second* of children more than two years, and treats of orphan asylums, homes for the protection of abandoned children, reformatories, etc.; the *third* of school hygiene, including the care of children from six to fifteen years of age.

The plans and elevations of schoolhouses, their warming and ventilation, as well as the course of studies, show the city of Buenos Ayres to have adopted all the improvements in use in the countries most advanced in popular education.

Besides, they have instituted a rigid medical inspection of schools since 1881, which is intended to guard the health of the children attending them and especially to protect them from contagious and epidemic diseases, and this inspection is made obligatory by the board on all schools in the State.

The rules governing the medical inspection of schools, approved by the National Board of Education, May 6th, 1886, are so thorough and practical that they ought to interest school boards and educators in this country, where so little is done to guard the health of children and so much to ruin it indirectly by injudicious if not criminal methods.

“ Article I. The Medical Inspectors shall have jurisdiction in all questions relating to the hygiene of schools.

“ Article II. They shall present a full report on all matters relating to the hygiene of schools, and shall furnish special reports when any matter needs special consideration.

“ Article III. When school-houses are to be constructed, school furniture or apparatus for gymnasiums are to be selected, all plans, models, or apparatus shall always be submitted to the inspector for his approval.

“ Article IV. No certificates shall be accepted unless signed by the Medical Inspector or by some one authorized by him.

“ Article V. The inspectors shall compile a manual embracing everything relating to the health of schools, for the use of directors or principals.

“ Article VI. School Boards shall aid the Medical Directors so as to facilitate their duties as far as possible.

“ Article VII. The Medical Inspectors shall present to the Board of Education on December 31st in each year a report resuming the principal acts of the past year, together with such observations and suggestions as experience shall have suggested to them.

“ Article VIII. Secretaries of school committees are bound to see that the directions of the Medical Inspectors are complied with in their districts.

“ Article IX. Reports on general questions of hygiene shall be furnished to the Board of Education by the Medical Inspectors whenever called for, and in such cases the Committees of School Districts can obtain the reports through the Board.

“ *Special duties.*—Each Medical Inspector shall have charge of seven districts, and his duties shall be as follows :

“ 1. To study the hours proper for the sessions of each class.

“ 2. To regulate the fitting of gymnasiums and the physical exercises of the children.

“ 3. To prevent overcrowding in the different classes.

“ 4. To vaccinate all children who are not already protected.

“ 5. To examine all children who, from constitutional weakness or impaired health, should remain at home during school hours.

“ 6. To notify parents whose children may be suffering from diseases which might be communicated to other children.

“ 7. To visit the schools frequently.

“ 8. To present to the National Board a quarterly report of the schools, with such observations and recommendations as experience may suggest.

“ 9. To furnish a report when called for by school committees on questions relating to the hygienic condition of each school.

“ 10. All the difficulties met with by the Medical Inspectors in the performance of their duties shall be removed by the committees, and the suggestions of the physicians shall always receive respectful attention.”

The chapter on School Hygiene may be appropriately closed by adopting the remark of Dr. Mangelot, Medical Inspector of the Schools of Paris. In speaking of medical and hygienic inspection of schools in different countries, he says of the Argentine Republic: “ It must be admitted that, in regard to preventive medicine, this Republic is more advanced than our own.”*

To secure such a condition for the public schools of this country would require the removal from all boards of education of personal ambition, of private jealousy, the subordination of political interests to public duties, of all favoritism in the discharge of public trusts, and of personal interest in the award of contracts. These are conditions which cannot be realized at present; indeed, the possibility of their accomplishment becomes more and more remote as patronage and the expenditure of public moneys increase and the opportunities for securing personal advantages are extended.

The State Laboratory.—The plan of the laboratory shows it to be complete in every particular. It is supplied with every modern improvement necessary for the successful performance of every kind of analysis. Every article destined for consumption is analyzed, whether it is presented by the purchaser or by the merchants or vendors who have them for sale.

Article V. says: “ Qualitative analyses, when requested by the public as to the good or bad quality of any article of consumption, will be made without charge, and result will be de-

* “ Il faut reconnaître que sur ce terrain de la médication préventive, cette petite république est plus avancée que la nôtre.”—*Revue d'hygiène et de police sanitaire*, tome viii., No. 11, Novembre, 1886.

clared as *good, passable, bad, dangerous, bad but not dangerous, adulterated but not injurious, adulterated and injurious.*"

There are expert inspectors appointed by the municipality, whose duty it is to procure samples of all goods supposed to be adulterated or unfit for use and have them examined. The result of such examination is marked as above.

During the year 1884, 2725 samples bought by the experts were examined ; in 1885, 3276 samples, and in 1886, 4133, of which last number 3003 were taken from the groceries and 1124 from the custom-house at the request of the importers, who wished to have the government stamp affixed as a guarantee of the good quality of the articles examined.

In 1886, 562 requests were made for examinations at the custom-house, and 30,309 pipes, 4842 half pipes, 53,796 quarter pipes, and 1592 one-eighth pipes of Spanish wine ; 63,850 cases of Bordeaux, 4115 of Italian, 3122 of native, and 200 of Portuguese wine were examined.

HOUSE-DRAINS AND HEALTH.—It was a little more than five years ago that Dr. Frank Hastings Hamilton wrote for the *Popular Science Monthly* an article on sewer-gas, in which he vigorously arraigned science for its failure to keep pace with civilization in the disposal of household wastes. The effect of Dr. Hamilton's article was quite unprecedented. His forcible presentation of facts and theories so affected the popular mind as to create an almost universal distrust of sanitary science, and, even at the present time, the idea prevails that plumbing fixtures in our houses are always a source of danger. In magazines and newspapers the discussion has been from time to time renewed, and the same pessimistic views are almost invariably held that were first advanced by Dr. Hamilton.

It is a subject of vital interest now to determine if this unfortunate condition of things described as existing five years ago still continues. We should know the truth or falsity of the assertion that there has been in late years a retrograde movement, hygienically considered, in substituting house-drains and sewers for the old earth-vaults and cesspools. Can we have plumbing fixtures in our houses without danger to health, or must we make great concessions in comfort and

convenience for the sake of safety? The question has lost none of its interest since Dr. Hamilton called into question the trustworthiness of sanitary science. Let us examine the evidence upon which the indictments have been made.—*From "Safety in House Drainage," by W. E. Hoyt, S. B., in the Popular Science Monthly for July.*

THE QUESTION OF SEWAGE DISPOSAL IN LONDON.

MR. CHARLES HANCOCK, F.S.S., who is one of the representatives of the Brompton Ward at the Kensington Vestry, and an active member of that body, has succeeded in again directing public attention to the important question of the disposal of the Metropolitan Sewage. He brought the subject before the Kensington Vestry early in May, and in consequence of the motion he then carried, he received a communication from the eminent sanitary engineer, Sir Robert Rawlinson, K.C.B., who, while condemning in the strongest terms the futility and costliness of attempting to purify sewage with chemicals, advocates the application of sewage to land; which, as Mr. Hancock points out, is in accordance with the express recommendation of Lord Bramwell's commission.

Mr. Hancock sent Sir Robert Rawlinson's letter to the *Times*, with some remarks of his own calling attention to the report on the subject, which Sir Henry Roscoe submitted to the Metropolitan Board of Works some months ago, but which the Board has treated as a secret document. The raising of this question led to the substance of the report referred to being communicated to the *Manchester Guardian*, and to the insertion of a letter in the *Builder* from Mr. Alexander Aird, an eminent English engineer, resident in Berlin.

In commenting on this letter, Mr. Hancock says: "I may say that the effect of the recommendations come to by Lord Bramwell's Commission has been somewhat misrendered, seeing that they (the Commissioners) did not suggest irrigation at all, but what may be termed its antitype—namely, filtration through soil, together with the deposition of the solid flocculent matter (sludge) on the surface of low land before the liquid

is discharged into the river." And in support of this view he quotes the following statement from a German sanitary authority: "It is not to be denied that the towns (in Europe) that have adopted the irrigation principle, as contra-distinguished from chemical precipitation, are the towns which stand highest from a hygienic point of view."

Writing to our own columns under date of May '6th, Mr. Hancock says, and we regret we cannot give his remarks *in extenso*: "I submit, in conclusion, that the question of the disposal of the Metropolitan Sewage, which has been so conclusively handled by Sir Robert Rawlinson, is one of the most important in the whole range of Local Government administration. And to no parish, I would add, is the matter one of more vital consequence than to Chelsea, bordering as it does upon so long a stretch of the once "sweet and silver" Thames, the continued pollution of which is a source of danger to the public and of serious injury to the value of the residential property on the Chelsea embankment. It is earnestly to be hoped that the local authority of Chelsea and those of other parishes bordering on the Thames will press upon the Metropolitan Board of Works the necessity of treating the London sewage by application to land instead of by the expensive and in the main delusive method of chemical precipitation alone."—*West Middlesex Advertiser*.

PRACTICAL HINTS ON DISINFECTION.—From "Disease Germs and How to Combat Them," by Lucius Pitkin, in the *Century* for July, accompanied by a frontispiece portrait of Pasteur:

First. Corrosive sublimate (mercuric chloride), sulphate of copper, and chloride of lime are among our best disinfectants, the first two being poisonous. At wholesale drug houses in New York single pounds can be obtained, mercuric chloride costing seventy-five cents, the others ten cents a pound.

Second. A quarter of a pound of corrosive sublimate and a pound of sulphate of copper in one gallon of water makes a concentrated solution to keep in stock. We will refer to it as "solution A."

Third. For the ordinary disinfecting solution add half a pint of "solution A" to a gallon of water. This, while costing

less than a cent and a half per gallon, is a good strength for general use. Use in about equal quantity in disinfecting choleraic or typhoid-fever excreta.

Fourth. A four per cent solution of good chloride of lime or a quarter pint of "solution A" to a gallon of water is used to wash wood-work floors and wooden furniture after fumigation and ventilation.

Fifth. For fumigating with sulphur, three to four pounds should be used to every thousand cubic feet air space. Burn in an old tin basin floating in a tub of water; keep room closed twelve hours, to allow the fumes to penetrate all cracks. Then open a window from the outside and allow fumes to escape into air.

Sixth. Soak sheets, etc., in chloride of lime solution, wring out, and boil.

Seventh. Cesspools, etc., should be well covered on top with a mixture of chloride of lime with ten parts of dry sand.

Eighth. Isolate the patient in an upper room from which curtains, carpets, and stuffed furniture have been removed.

Ninth. The solution of mercuric chloride must not be placed in metal vessels, since the mercury would plate them.

THE PANAMA CANAL.

RESULT OF THE RECENT EXPERT EXAMINATION OF THE SCHEME.

Engineering News of June 2d publishes an article on the "Actual Status of the Panama Canal," giving the results of a recent expert examination of the entire length of the canal, and accompanied by a progress profile, showing the amount of work done and undone to January 1st of the present year, both for the sea level and lock canal. The profile shows that the only work which is anywhere near completion is about eleven miles of dredging on the Atlantic end and about a mile at the Pacific end. On the remainder of the work the proportion done is very small in comparison with that undone.

The estimate given in connection with the profile shows a total of 34,081,000 cubic metres remaining, without allowing for the changes of river channels, Gamboa dam, etc., which

raises the aggregate to 51,000,000 cubic metres. The company had admitted 32,000,000 to 40,000,000 metres. At the highest rate yet reached, of 1,000,000 cubic metres per month, it is estimated that at least four years will be necessary to finish the canal, if there is no lack of money.

The total amount of cash actually expended up to the present date is \$177,910,000, represented by \$351,150,900 of securities. The amount necessary to be raised to complete the canal is estimated by the *Engineering News* at a minimum of \$230,000,000, which would be represented by at least \$500,000,000 of new securities.

The article declares that the progress profile makes it evident that not over one tenth of the work nor one twentieth of the money has yet been spent which would be required to open a sea level canal, which De Lesseps declared last November would be opened February 30th, 1890. Therefore we can only escape from the conclusion that the impossibility of completing a sea level canal has been known for three or four years at least by assuming colossal ignorance, either of which is equally fatal to their credibility in regard to the lock project. The worst feature of the progress profile, to those familiar with the proper conduct of public works, is not so much the small aggregate of work done, but the distribution of it in the damning evidence it bears that all has been done for theatrical effect, to facilitate "raising the wind" by producing an impression on the ignorant and unthinking, rather than to so conduct the work as to complete it in the least time, at the least cost. The worst feature of all is the "completed section" on the marshes, which should not have been touched at all until the heavy work was nearly done. The next worst is doing so much work where it is likely to be washed out by floods in the Chagres River, without first completing the costly and doubtful damming and diversions of that river, which are hardly yet begun.

The article is illustrated by views from different standpoints showing the enormity of the undertaking, profiles of the work during its progress, and the evident indirectness of purpose—consequent upon what now appears to have been insufficient comprehension at the outset. It is, in short, a cogent exposure of what now appears to be inevitable—the most gigantic failure of engineering enterprise ever undertaken.

THE CLIMATE OF SIBERIA.

FROM George Kennan's illustrated account of the "Plains and Prisons of Western Siberia" in the June *Century* we quote the following: "It is hardly necessary to say that a country which has an area of five and a half million square miles, and which extends in latitude as far as from the southern extremity of Greenland to the island of Cuba, must present great diversities of climate, topography, and vegetation, and cannot be everywhere a barren arctic waste. A mere glance at a map is sufficient to show that a considerable part of western Siberia lies farther south than Nice, Venice, or Milan, and that the southern boundary of the Siberian province of Semirechinsk is nearer the equator than Naples. In a country which thus stretches from the latitude of Italy to the latitude of central Greenland one would naturally expect to find, and as a matter of fact one does find, many varieties of climate and scenery. In some parts of the province of Yakutsk the mean temperature of the month of January is more than 50 degrees below zero, Fahr., while in the province of Semipalatinsk the mean temperature of the month of July is 72 degrees above; and such maximum temperatures as 95 and 100 degrees in the shade are comparatively common. On the Taimyr peninsula, east of the Gulf of Ob, the permanently frozen ground thaws out in summer to a depth of only a few inches, and supports but a scanty vegetation of berry bushes and moss, while in the southern part of western Siberia watermelons and cantaloupes are a profitable crop, tobacco is grown upon thousands of plantations, and the peasants harvest annually more than 50,000,000 bushels of grain. The fact which I desire especially to impress upon the mind of the reader is that Siberia is not everywhere uniform and homogeneous. The northern part of the country differs from the southern part quite as much as the Hudson Bay territory differs from

Kentucky ; and it is as great a mistake to attribute the cold and barrenness of the Lena delta to the whole of Siberia as it would be to attribute the cold and barrenness of King William Land to the whole of North America.

“ To the traveller who crosses the Urals for the first time in June nothing is more surprising than the fervent heat of Siberian sunshine and the extraordinary beauty and profusion of Siberian flowers. Although we had been partly prepared, by our voyage up the Kama, for the experience which awaited us on the other side of the mountains, we were fairly astonished upon the threshold of western Siberia by the scenery, the weather, and the flora. In the fertile, blossoming country presented to us as we rode swiftly eastward into the province of Tobolsk, there was absolutely nothing even remotely to suggest an arctic region. If we had been blindfolded and transported to it suddenly in the middle of a sunny afternoon, we could never have guessed to what part of the world we had been taken. The sky was as clear and blue and the air as soft as the sky and air of California ; the trees were all in full leaf ; birds were singing over the flowery meadows and in the clumps of birches by the roadside ; there were a drowsy hum of bees and a faint fragrance of flowers and verdure in the air ; and the sunshine was as warm and bright as that of a June afternoon in the most favored part of the temperate zone.”

INDIA-RUBBER TREES.—The belt of land around the globe, five hundred miles south of the equator, abounds in trees producing the gum of India-rubber. They can be tapped for twenty successive seasons without injury, and the trees stand so close that one man can gather the sap of eighty in a day, each tree yielding on an average three tablespoonfuls a day. Forty-three thousand of these trees have been counted in a tract of country a mile long by eight wide. There are in America and Europe more than one hundred and fifty manufactories of India-rubber articles, employing some five hundred operatives, and consuming more than ten million pounds of gum a year, and the business is considered to be still in its infancy.—*South of India Observer.*

ABSTRACT OF THE PROCEEDINGS OF THE CONFERENCE OF STATE BOARDS OF HEALTH, CINCINNATI, O., MAY 4, 1888.

THE President, Dr. J. N. McCormack, Secretary of the Kentucky State Board of Health, opened the proceedings with the following address, twenty-four delegates being present :

“ As ours is a semi-official organization, met to discuss questions previously submitted by a State board of health in regard to problems which have arisen or are likely to arise in official work, I have not thought it necessary, during the three years you have honored me by making me your presiding officer, to consume your time in listening to an annual address. I shall not now deviate from this custom, but there is one question of the greatest importance to us as executive officers, and of interest indeed to every citizen of the country, to which I desire to ask your earnest attention at the outset of your labors.

“ In the face of the danger of an invasion of Asiatic cholera during the present year, the inefficiency of the quarantine appointments at the port of New York is a menace to the whole nation. After four years of warning the health officials of that great port were unprepared to deal with cholera-infected ships last year ; and, although the danger still continues, no adequate efforts have been made to conform the quarantine defences to the present advanced state of sanitary science, although the defects have been fully recognized and admitted by the highest professional and official authority, and a quarantine bill without sufficient available means has recently passed as a sort of compromise measure. The information comes to us, from apparently reliable sources, that the whole difficulty in securing such legislation, appropriations, and administration as will give adequate protection at this port is of a political nature, and that this difficulty is likely to continue.

“ Whatever may be the cause of the neglect, there can be little question but that its existence imposes grave responsibilities upon each of us, who are made by law the health guar-

dians of the people of our respective States. While the political leaders of New York are, as we think, in their greed for power and spoils, shamefully abusing a great public trust in this regard, we should consider the means at our command to limit the disease to this one State, if it is possible to do so. The majority of our boards are entrusted with large quarantine powers as against diseases of this class, and it appears to me that one of the most important duties before this Conference is to arrange for that concert of action in regard to the administration of these laws, should the occasion arise, as will give the least interference with commerce consistent with the proper protection of our people. Any plan of action agreed upon by you will of course be well considered and conservative, but it is more likely to be so if arranged for now than if separate action be taken by the respective boards during the panic and popular clamor attending the actual presence of an epidemic.

“I make no reference to the threatened danger from yellow-fever and small-pox because action relating to the prevention of these diseases is contemplated in the questions formerly submitted in the programme.”

Dr. P. H. Bryce, Secretary of the Provincial Board of Health of Ontario, read a paper recommending the erection of hospitals for the treatment of cases of scarlet-fever, diphtheria, etc., as well as small-pox. The paper provoked a wordy discussion, the opinion seeming to prevail that the use of such hospitals, at least in America, would necessarily be confined to such cases as could not be properly isolated and treated at home.

The subject of quarantine was discussed—as to whether it should be under national or State control; how State Boards could co-operate for inland quarantine, and what each State Board of Health could and should do to prevent the introduction of cholera, small-pox, and yellow-fever into States free from such diseases.

Dr. Benjamin Lee, Secretary of the Pennsylvania Board, read a paper recommending national control of quarantine, and presented the following resolution, which was adopted:

“*Resolved*, That this Conference heartily endorses the bill now before the Congress of the United States, proposing to

establish seven well-equipped quarantine stations at certain points on the Atlantic and Pacific coasts, and urges that early action be taken upon the same ; and we also urge upon Congress the passage of the bill to establish a National Bureau of Health."

Dr. J. F. Kennedy, Secretary of the Iowa Board of Health, read a paper on Inland Quarantine as against Cholera and Yellow-fever.

The following resolution was offered by Dr. Charles N. Hewitt, Secretary of the Minnesota Board :

"*Resolved*, That a committee of nine be elected by this Conference, by ballot, to visit or correspond with the State, provincial, and other authorities having charge of the seaboard quarantine against dangerous infectious diseases, for the purpose of learning the methods there in use, and the character and amount of co-operation such authorities can and will give for the best protection of the people of this continent against said disease, and that said committee be authorized to act for this Conference for this purpose, and be instructed to report the results of their investigation to this Conference and State Boards of Health, and to arrange for such co-operation, should any such diseases threaten to invade or actually get a foothold on this continent."

The selection of this committee, as finally made, was as follows : Dr. John H. Rauch, Illinois ; Dr. C. N. Hewitt, Minnesota ; Dr. J. N. McCormack, Kentucky ; Dr. John D. Jones, Ohio ; Dr. P. H. Bryce, Ontario ; Dr. Henry B. Baker, Michigan ; Dr. James Simpson, California ; Dr. Benjamin Lee, Pennsylvania, and Dr. T. Grange Simmons, of South Carolina.

What should be done to prevent the continued introduction of scarlet-fever and diphtheria was discussed, Dr. Baker emphasizing the fact that these diseases were far more destructive to life than small-pox or yellow-fever, and that they should be excluded from our country with the same care as is taken to keep out those more dreaded diseases.

The following resolution, in relation to this subject, was finally adopted :

"*Resolved*, That, in the judgment of this Conference, the interests of the public health will be conserved by emphasizing the

fact that diphtheria and scarlet-fever are diseases of such highly contagious and infectious character that they should be dealt with by the most thorough isolation of all cases, the most thorough disinfection of all infected articles and places, and by quarantining them at the seaboard and at all other places with the same care that is taken with reference to small-pox or cholera."

Dr. Baker, of Michigan, spoke of the continued presence of yellow-fever in Florida and the dangers to be apprehended therefrom, and offered the following resolutions, which were adopted :

"WHEREAS, It is alleged that yellow-fever is now present in Florida, a State not represented here, because it has no State Board of Health, and which is in daily communication with other States, and thus may threaten all of our States in which that disease can prevail ; therefore,

"*Resolved*, That all boards of health in States adjoining Florida are urged to immediately and continuously exercise extreme care to keep the fever from entering their States.

"*Resolved*, That, in case it shall prove that yellow-fever is present in Florida, boards of health of adjoining States should establish and maintain a thorough system of so-called 'inland quarantine,' which means the inspection of travellers, the isolation of all infected persons and articles, and complete disinfection, these methods to be enforced with the least possible interference with travel and commerce consistent with the protection of the public health."

The question, What is your State Board of Health doing to advance Sanitary Science by the collection of statistics of deaths, sickness, and of meteorological conditions coincident with sickness and deaths, was answered by the delegates of the States represented.

The answers indicated that while much was being done in most of the States represented, in none were such collections as complete as could be wished. The great necessity for such collection is felt when the question is asked : What success is attending your efforts to limit the sickness and deaths from preventable diseases ?

Dr. Lee, of Pennsylvania, read an interesting paper on leprosy, bringing considerable evidence in proof of the contagiousness of this disease.

Dr. Lee offered a resolution recommending strict quarantine against leprosy, segregation of the sick with distinct hospitals for all such cases, with cremation or burning in lime of bodies of deceased lepers, and destruction by fire, after disinfection, of their personal effects.

The resolution, after some discussion, was referred to a committee to report at the next annual meeting of the Conference.

The question of how cholera could be prevented becoming epidemic in the event of its reaching America was discussed by different ones present, and the opinion sustained that proper measures could undoubtedly prevent such occurrence.

The following Constitution was adopted :

CONSTITUTION.

NAME.

The name of this association shall be THE NATIONAL CONFERENCE OF STATE BOARDS OF HEALTH.

MEMBERSHIPS.

The members of this Conference shall be the executive officers or other delegated representatives of the State Boards of Health of the United States, and of the Provincial Boards of Health of the Dominion of Canada.

DUES.

Each board represented shall pay to the Treasurer of the Conference five dollars per year.

VOTES.

Whenever demanded by two delegates, any question shall be determined by a vote by States, each State being entitled to one vote.

OFFICERS.

The officers of this Conference shall be a President, Secretary, and Treasurer.

The duties of each officer shall be those which are usually performed by such an officer ; and collectively the officers

shall be an executive committee to make suitable provision for meetings of the Conference, for programme, etc.

PARLIAMENTARY RULES.

Cushing's Manual shall be the guide to parliamentary action, in case of question.

AMENDMENT OF THIS CONSTITUTION.

Notice of the nature of any proposed amendment of this constitution shall lie upon the table from one annual meeting to another before coming to a vote. Such notice having been given, this constitution may be amended at any regular meeting of the Conference, if a majority of the States and Provinces represented vote in favor of such amendment.

The election of officers resulted in the choice of Dr. J. N. McCormack, of Kentucky, President; Dr. C. O. Probst, of Ohio, Secretary, and Dr. Henry B. Baker, of Michigan, Treasurer.

Dr. Lee, of Pennsylvania, offered to publish the proceedings of the meeting in the Annual Report of the Pennsylvania State Board of Health, which offer was accepted.

The time and place of next meeting was left to the Executive Committee.

THE MEDALS, JETONS, AND TOKENS ILLUSTRATIVE OF SANITATION.*

By Dr. HORATIO R. STORER, Newport, R. I., Member of American Public Health Association, etc.

IX. *Famine.* Starvation pieces have a place in our summary of the medals of sanitation, since they commemorate a cause than which there is none greater or more certain, of the most fatal and wide-reaching epidemics. These are variously called famine ("theuerung," "theure zeit") or calamity ("noth," "elend") medals, and they are subdivided into those especially commemorating dearth of food ("hunger");

* Continued from Vol. XX., page 355.

the occurrence therewith of astronomical phenomena, especially comets ("Kometen"), through dread of which and the consequent discouragement, field labor was often materially lessened; the flight of locusts ("heuschrecken"); excessive rainfall or inundations ("ueberschwemmung," a deluge); prolonged drought ("wassermangel"); the overabundance of field mice ("mäusen"); great cold ("harte winter," "Kälte"); hail-storms ("hagelwetter"), etc., etc. There might also be legitimately included many of the so-called siege or obsidional pieces, had we but the space for them.

In this country we have had scarcely any issues of the kind, the nearest being the series of "Hard Times" tokens of 1834-7, and the Rebellion or Civil War tokens of 1861-5. These, however, are rather political mementoes upon the one hand, or store cards and the like upon the other, even though occasioned by a scarcity of metallic currency. They cannot, therefore, be admitted to the present consideration. Again, there are a large number of bakers' tokens, both American and foreign, usually in the nature of private advertisements, which must also be excluded. The tokens of poor-houses, alms-houses, and soup societies might be admitted had we the space, but those of the German "Consum-vereine" and similar associations would seem properly to be outside our present list.

The literature of the general subject may be stated as follows:

(a) *Ancient Famines.*

Boeclerus, Johann Heinrich. *Dissertatio de Annonâ Augustorum, sive de annonâ sub imperatoribus Romanis.* (With plates of coins.) Argent., 1722, 8°.

Carus, Ann. *Epistola ad Ursinum, etc.* (Annona, etc.) Venice, 1592, 4°.

Hofmann, Gottfried Dom. *De numis Romanorum frumentariis.* Tubingen, 1774, 4°.

(b) *Modern Famines.*

Bidermann, Johann Gottlieb. *Von Hungermünzen.* (1 pl.) Dresden, 1772, 4°.

Gedächtnissmünzen auf die Theurung. *Lausitzisches Magazin*, 1779, p. 254.

Pfeiffer, L. and Ruland, C. *Pestilentia in nummis.* Weimar, 1880, 8°.

—— — *Ibid.* (2 pl.) Tübingen, 1882, 8°.

—— — Numismatische Nachweise, etc. (Comets and Locust devastation.) *Correspondenz. Blätter des Allg. ärztl. Vereins von Thüringen*, 1881, p. 342.

—— — Die Thüringischen Pest- und Theurungs-Münzen. *Deutsches Archiv für Gesch. der Medicin*, etc., 1882, no. 4.

—— — Die Deutschen Pestamulette. (The Plague, Cholera, Comets, Locusts.) *Ibid.*

I. ANCIENT FAMINES.

There are a great many ancient coins that hitherto have been supposed to indicate years of abundance or general prosperity, that probably in reality chronicle periods of famine, during which unusual importations of grain were made into Greece and Rome from foreign colonies, or general distribution of breadstuffs occurred from the national or imperial granaries. Some of these coins bear the legends ANNONA or A. PVBLICA. The terms CONCIARIVM and ALIMENTA are used in a similar manner. Often there is but the representation of a female—perhaps more than one—with a cornucopia; at other times merely this emblem alone; at others still, but a sheaf of wheat; or again but an ear of this latter, perhaps accompanied by a poppy capsule, which plant was sown, we are told by Pliny, by farmers in their cornfields as an offering to Ceres. Sometimes this goddess is represented as holding a cornucopia upright, to signify that the corn was not to be wasted, or she delivers it to Equity to distribute, who stands at her side with scales, and the hasta pura or pointless spear. Often there is also the prow of a ship, its rudder, or an oar, to show that the corn had crossed the sea, and the voyage had been prosperous. In the later years of the Roman Republic, corn was sold cheaply to the poor in times of scarcity, having been previously collected in the Government storehouses. Under the emperors, it was not merely gratuitously distributed, but given as pay for regular, or reward for exceptional, service.

With this key to ancient coins and medals illustrative of seeming plenty, even in some cases where COPIA, ABVN-

DANTIA, VBERTAS and the like are inscribed, it is probable that the dates of many ancient famines and many accompanying epidemics may be accurately ascertained. Scholars are now recognizing more and more clearly that much that has formerly been considered arbitrary, accidental, or unintelligible in classical numismatics in reality chronicles the most ordinary and prosaic, though important, events in history. I own many of these ancient medals of starvation, and have notes of others, but am precluded from saying more about them for want of space.

II. MODERN FAMINES.

These medals and tokens have been given with such accuracy and tireless research by Pfeiffer and Ruland in their "Pestilentia in Nummis," to both editions of which work I have already referred, that I will attempt to do little save briefly to indicate what they have described, and to record such pieces as seem to have escaped their notice. It is only to be regretted that, in the numerical registration adopted in their edition of 1882, running references were not given to the less complete enumeration in the previous edition of 1880.

There are three individuals whose medals should be mentioned in this connection.

A. GERMANY.

Dr. Rudolph Virchow of Berlin (1821-), who was sent by the Bavarian Government in 1852 to investigate the causes of a famine then existing.

401. Obverse. Bust, bearded, to left. Beneath, Prof. G. Dupré Dir. L. Gori inc. Inscription: A Rodolfo Virchow di Berlino.

Reverse. Within a laurel wreath, Dalla | Patria di Morgagni | I Medici Italiani | MDCCCLXXIII. Bronze.

Rüppell, Beiträge, etc., 1876, p. 54.

Professor Virchow will be again mentioned in Sections X., Typhoid, Leprosy, and Syphilis; and XI., Military Hygiene. His medal is not mentioned by P. and R.

Frau Elizabetha Kraussin of Nuremberg (1569-1639), a general benefactress of her city. The "bread" commemorated may perhaps in part have been used in its metaphorical sense.

402. Inscription: Avxiliatrix Ervditionis Et Consolatrix

Pavpertatis . Brich Dem Hvngrigen Dein Brodt . Iesa 58 |
v. 7.

Gaetani, ii., p. 21, pl. cv., No. 3.

403. 1739. Inscription: Das Gedächtniss Des Gerechten
Bleibt In Segen. (Solomon's Song, x. 7.)

Schulze, Deutsche Spruchweisheit auf Münzen, Medaillen,
etc. (Archiv für das Studium der neueren Sprache, Bd. lvi.,
Heft 1, p. 77.)

Upon the hundredth anniversary of the Kraussin Institute
at Nuremberg.

404. 1790. Upon the one hundred and fiftieth anniversary
of the same.

Ibid., p. 79.

These are all unmentioned by P. and R.

B. RUSSIA.

Graf Nicolaus Petrowitsch Scheremetjeff, to commemorate
his success in subduing a famine and its accompanying epi-
demic of the plague.

405. Obverse. Military bust, to left, with decoration. Be-
neath, C. Leberecht Eques F. In Russian, the Graf's full name.

Reverse. Hygeia extending a cluster of wheat ears and a
palm branch to a woman seated, with a child at her feet. On
her left arm a serpent, drinking from the chalice which she
extends to a sick person. Above (in Russian), Compassion.
Exergue (in Russian): From the imperial Senate, 1804. Upon
its ridge, Leberecht. Bronze. 50.

Rüppell, 1876, p. 18.

Unmentioned by P. and R.

The following are the minor famine issues.

A. ITALY.

This country is placed first in sequence, because its earliest
issue of the kind (1505) antedates all others.

1. *Milan.*

406. Obverse. Inscription: Io | L. Arese M^{ta}. 2. | Riso
(Two measures of rice.)

Reverse. The four Sts. Mary, with halos, and hands folded
upon the breast.

Neumann, No. 35,561.

Unknown to Pfeiffer and Ruland.

407. Obverse. 1710 | Pane (bread) | M . Q . (Marie quattro, the four Marys.)

Reverse as preceding.

Ibid., No. 35,562.

Unknown to Pfeiffer and Ruland.

408. Obverse. 1769 . | * Riso * | Meta | * Due | . *

Reverse as preceding.

Ibid., No. 35,563.

Unknown to Pfeiffer and Ruland.

409. Obverse. Pane (bread) | De | L. P.

Reverse. A capital M (signifying, with the initials upon the obverse, the Logo Pio della Misericordia).

Ibid., No. 35,566.

Unknown to Pfeiffer and Ruland.

410. Obverse as preceding.

Reverse. A capital C (signifying, with the initials upon the obverse, the Logo Pio della Santa Corona).

Ibid., No. 35,567.

Unknown to Pfeiffer and Ruland.

411. Obverse. . Pane . E . | Riso . Del . P . L | De . S . S .
Rocco E. Vittore (the Logo Pio of Sts. Roque and Victor).

Ibid., No. 35,568.

Unknown to Pfeiffer and Ruland.

The above, and still others that might be cited, though eventually merely charity tokens from religious houses, redeemable upon presentation, were at first issued in times of famine.

2. *Parma.*

412. 1591. Obverse. Head of the duke, to left. Inscription : Al . F . (Alessandro Farnese) Spec-vlator.

Reverse. II | P.

Pfeiffer and Ruland, p. 21, No. 28.

413. Obverse and reverse. Head of the duke, to left.

Ibid., No. 29.

3. *The States of the Church.*

(a) *Bologna.*

414-15. 1529. Obverse. St. Petronius, with the city in his hand ; beneath, the arms of Bologna. Inscription : Cogente . Inopia . — . Rei . Frumentariae .

Reverse. Above, " il cane con la torcia in bocca " (a dog

with a torch in its mouth). Inscription : Ex Collato . | Aere .
De . Rebus | Sacris . Et . Pro | phanis . In . Egeno | rvm .
Svbsidivm | . M . D . XXIX. Bononia . | * Silver.

Scilla. Breve Notizia delle monete pontifice, 1715, p. 40 ;
P. and R., p. 16, No. 6.

Struck at Bologna, during the reign of Pope Clement VII.,
by the Order of Dominicans, whose crest the reverse bears.
Pfeiffer and Ruland call the Patron Saint of Bologna merely
“ a bishop,” unnamed, with “ a church ” in his hand. They
give on obverse Frvmentarie, and on reverse, instead of the
dog and torch, “ a lion.” They do not recognize that this was
a private issue of the Dominican Order, but class it as struck
by the city of Bologna. It was a piece of “ four giulie.”
There are two varieties, the second of which, without the stars
or rather rosettes upon the reverse, was unknown to Pfeiffer
and Ruland.

416. Obverse and reverse as the last, without rosettes on
the reverse. Gold.

Scilla, p. 132.

A three-scudo piece. It was unknown to Pfeiffer and
Ruland.

(b) *Rome.*

Pope Julius II. (1505).

417. Annona Pontificia.

Venuti, p. 50, vii. ; P. and R., p. 13, No. 1.

Not mentioned by Bonanni in his officially prepared “ Nu-
mismata Pontificum Romanorum,” 1699, fol.

418. Annona—Pvblica.

P. and R. seem correctly to omit the dot in legend.

Bonanni, i., p. 139, fig. x. ; Scilla, p. 217 ; Tresor de Numis-
matique, Méd. pap., iv., 4 ; Armand, ii., 110-17 ; P. and R.,
p. 13, No. 2, fig.

419. Obverse. Within a garland of oak leaves, Jvlivs . II .
Pont . Max . Roma . Seditiōib . Fameq . Libata (liberata).

Reverse. Sts. Peter and Paul. Legend : In Omnem . Ter-
ram . Exivit . Son (us). Eor (um). Silver.

Scilla, pp. 28, 217.

A teston. Unknown to Pfeiffer and Ruland.

Pope Paul III. (1540).

420. Annona . Pontificis .

P. and R. omit the dot in legend. Bonanni, i., p. 199, fig. v.; Venuti, p. 75, v.; P. and R., p. 17, No. 8.

421. Obverse. An . Iobilaeo .

Reverse. Annona . Pont .

Armand, ii., p. 168.

In the National Cabinet of France. It is wrongly referred by Armand to the last mentioned of Bonanni. Unknown to P. and R.

422. Obverse. A . XVI .

Reverse as preceding.

Litta . Famiglie celebri d'Italia (Farnese II.), Milan, 1819 ; Armand, ii., p. 168, No. 23.

Unknown to P. and R.

423. Obverse. An. XIII.

Reverse. The goddess of Plenty, with Rome in her hand, a cornucopia, basket of wheat ears, and prow of ship. Legend : Dapsilitas Macer (atae). Silver.

Scilla, pp. 44, 237.

A teston. Struck at Macerata and Naples. Unknown to P. and R.

Pope Julius III. (1555).

424. Obverse. Anno-na-Pont. Silver.

P. and R., p. 17, No. 9.

425. As preceding, save A. III on obverse, and stars instead of dots. Bronze.

Ibid., p. 183.

426. Obverse. Annona . Pont . A. V. (anno quinto.)

Bonanni, i., p. 243, fig. xiii.; Venuti, p. 96, xxi.; P. and R., p. 17, No. 10.

Pope Pius IV. (1560).

427. Female erect, with cornucopia and scales.

Venuti, p. 121, xxxv.; P. and R., p. 20, No. 20.

This is not given by Bonanni. In the medals of previous pontificates, save in a single instance, Pope Martin V., Optimo . Pon-tifici . (Bonanni, i., p. 1, fig. iii.), the scales and cornucopia have not been united in the same allegory. They have been, in the Gregory XIII., In . Aeqvitate . Abvndantia (*Ibid.*, i., p. 323, fig. v.). In the other instances the scales (Justice) have always been accompanied by the drawn sword, as in Popes Innocent VIII., Jvstitia—Pax—Copia (*Ibid.*, i.,

p. 107, fig. iv.), Leo X., Fia-t . Pax . In . Virtv-te . Tua (*Ibid.*, i., p. 163, fig. iii.), and in this same reign of Pius IV., Dis-cite . Ivstitiam . Moniti . (*Ibid.*, i., p. 271, fig. ix.), and Gregory XIII., Ivstitia . Pacem, etc. (*Ibid.*, i., p. 323, fig. xxxii.). Can the present have become confounded with the following?

428. Annona . Pont . Figure of Plenty, erect, with cornucopia upon left arm, and in right hand a small figure of Justice, with scales and spear. At right of field, a wagon loaded with shocks of grain ; at left, a basket filled with wheat ears. The dots in inscription are triangled.

Bonanni, i., p. 271, fig. xxxv.

Unknown to P. and R.

429. Anno . Pont . A . V .

Venuti, p. 121, xxxvi.; P. and R., p. 20, No. 21.

This was unknown to Bonanni. As the inscription and device (Plenty, seated) are the same as already given of Julius III. and recognized by Bonanni, it would seem that this might be a mule of that reverse, with the obverse of Pius IV.

430. Providentia Pont .

Venuti, p. 116, xx.; P. and R., p. 20, No. 22.

P. and R. give the first word of the legend as unbroken, and the device as merely Plenty, erect ; but Bonanni, if his medal is the same, has Providen-tia, and to left of the figure an altar (*Loc. citat.*, i., p. 271, fig. xii.), as in the following. If they were not the same, then the present was unknown to Bonanni.

Pope Pius V. (1575).

431. Providen-tia Pont .

P. and R., p. 20, No. 23.

Unknown to Bonanni. Possibly a mule of the reverse of Pius IV. just described, with obverse of Pius V.

432. Ann-ona . Pont

Bonanni, i., p. 291, fig. xxv.; Venuti, p. 131, xxviii.; P. and R., p. 20, No. 24.

P. and R. have Annona, but the word is distinctly divided upon the figure of the medal.

Pope Gregory XIII. (1576).

433. Anno—na—Pont Plenty, with cornucopia and little figure of Victory in her right hand, leans against a ship's prow. Beside her, a basket of fruit and ears of grain.

P. and R. omit the inscription.

Bonanni, i., p. 373, fig. vi.; Venuti, p. 140, xxii.; P. and R., p. 21, No. 25.

434. Annona . Pont . 1576

Armand, i., p. 267.

Wrongly referred by Armand to that preceding. Unknown to P. and R.

Pope Gregory XIV. (1591).

435. Diebvs . Famis . Satvrabvntvr .

P. and R. have Satvrab .

Bonanni, i., p. 441, fig. iv.; Venuti, p. 181, viii.; P. and R., p. 21, No. 30.

Pope Clement VIII.

436. Obverse. An. II. (1593.)

Reverse. Annona. Pvblica.

Armand, i., p. 305, 1.

Unknown to P. and R.

437. Obverse. A. VII. (1599.) P. and R. omit the dot after Clemens.

Reverse as preceding, but without dot in legend.

Bonanni, i., p. 457, fig. vi.; Venuti, p. 194, xxiii.; P. and R., p. 22, No. 33.

This is in my collection.

Pope Urban VIII. (1642).

438. Within joined branches of laurel, Vberiori . Annonæ .
Commodo

Bonanni, ii., p. 563, fig. xxvii.; Venuti, p. 242, lxii.; P. and R., p. 24, No. 43.

This is in my collection.

439. The same, without the branches of laurel.

P. and R., p. 24, No. 44.

This was unknown to Bonanni.

Pope Clement X. (1671-3).

440-1. Malvm Minvit—Bonvm Avget . | Clem . — Lib.

With arms, upon obverse, of Giovanni Battista Costaguti, President of the Mint, and afterward Cardinal.

Scilla, p. 95 ; Madai, 676 ; P. and R., p. 27, Nos. 51, 52.

These were two scudi, of which Scilla mentions but the first. They were unknown to Bonanni.

442-3. Vti Abvndetis Magis | M. DC.—LXXII.

This has also the Costaguti arms. P. and R. give dots in the legend.

Bonanni, ii., p. 719, fig. xxii.; Scilla, p. 95; Madai, 677; P. and R., p. 27, Nos. 53, 54.

Also a scudo. There are two obverses of this.

444. Vt . Abvndantivs Habeant | 1673.

Bonanni gives no dot in legend, and omits date in exergue.

Bonanni, i., p. 719, fig. xix.; Venuti, p. 287, xvi.; Köhler, M. B., xx., p. 166, No. 623; P. and R., p. 27, No. 55.

445. Similar to the above save that in obverse, instead of A. IIII., as given by P. and R., there is An., and instead of Io . Ham ., there is Io . Hameranvs . F. There are also dots after the two first words in legend of reverse.

Unknown to P. and R. It is in my collection.

Pope Alexander VIII. (1690).

446. Re · Frvmentaria · Restitvta · | CIOIO—CXC Silver.

Scilla, p. 107; Madai, 690; P. and R., p. 29, No. 64.

A teston. For this reason perhaps unmentioned by Bonanni.

447. The same in gold (four scudi).

Scilla, pp. 152, 285.

Unknown to P. and R.

448. Nostra Felicitas · —1690.

Venuti, p. 312, x.; Köhler, M. B., xx., p. 342, No. 701; P. and R., p. 29, No. 65.

Pope Clement XI. (1704-5).

449. Addito—Annonae | Praesidio . | .1704.

The dots are three cornered on obverse and in exergue of reverse.

Venuti, p. 333, xx.; P. and R., p. 36, No. 83.

This is in my collection.

450. Commodiori . Annonæ . Præsidio · | 1705.

Venuti, p. 333, xxii.; P. and R., p. 36, No. 84.

451. As last, but stars instead of dots in obverse, and dots in legend of reverse.

This was unknown to P. and R. It is in my collection.

Pope Clement XIII. (1760).

452. Vt.—Comedant · Pavperes · Popvli · | MDCCLX.

P. and R., p. 40, No. 102, fig.

B. HOLLAND.

(a) *Amsterdam.*

453. Obverse. The City arms. Above, 1662.

Reverse. W (yk, the name of a district). Above, 6. Lead.

Van Loon, ii., p. 486 ; P. and R., p. 25, No. 49.

454. Obverse. The City arms (1698).

Reverse. W. Above, 32.

Van Loon, iv., p. 287 ; P. and R., p. 36, No. 81.

455. As above, save four cornered.

Ibid., No. 82.

(b) *Delft.*

456. Obverse. The City arms. Above, 1531. Inscription :
Den · Armen · Gelt · In · Delfft +

Reverse. Inscription : Dans | Elemosinā (æ) | Largiter |
Fidelib9 (us).

Van Mieris, ii., p. 210 ; P. and R., p. 16, No. 7.

457. Obverse. The City arms. Above, within a wreath of
leaves, 1559.

Reverse. Within a similar wreath, a dove (the symbol of
the Alms House of the Holy Ghost).

Van Mieris, iii., p. 416 ; P. and R., p. 17, No. 13.

458. Obverse and reverse similar to above, save the date is
1561.

P. and R., p. 17, No. 14.

(c) *Leyden.*

459. Obverse. The City arms, with two crossed keys.
Above, 1573. Inscription : Gedenct · Der · Armen ·

Reverse. A winged wheel within a circle of pearls.

P. and R. wrongly transpose the figures in the date, giving
it as 1537.

P. and R., p. 21, No. 26.

C. BELGIUM.

(a) *Antwerp.*

460. Obverse. A three-towered castle. Near the middle
door a hand, which was the mint mark of Antwerp. Legend :
Amor CiViVm . Inexpvgnabile . Castrv ' +.

Reverse. Legend : Esperant . Iendvre . L'An. 1546.

Neumann, No. 35,296.

Issued during famine. Unknown to P. and R.

(b) *Bruges.*

461. Obverse. A chalice, over which Our Saviour. Upon either side, 15-53.

Reverse. An irradiated cross. Lead. Octagonal.

Neumann, No. 35,312.

A bread token of the Church of Notre Dâme. Unknown to P. and R.

(c) *Brussels.*

462-4. Three Masonic bread tickets.

Marvin, loc. citat.

(d) *Flanders.*

465. Obverse. Inscription: Qvi Absc- | ondit · Frv | menta · Mala · Di- | cetvr · In Popvls · Bened · | Svper Capvt | Vendent · (Solomon's Song, xi. 26.)

Reverse. Beat · Qvi | Intelligit · Sv | per · Egen · Et | Pavperem · In | Die Mala Liberabit · Ev(m) | Dominvs · | 1557 (Psalm 41 : 2.)

Van Loon, i., p. 18 ; P. and R., p. 17, No. 12.

466. Obverse. Representation of God the Father. Beneath, a dove (the Holy Ghost). Inscription: Aelmoesse · Van · 4 Stu · (Stivers) Gefondert.

Reverse. Coat of Arms. Upon either side, 15-58. Inscription: ī De · Kercke Vā D · Zarele — · In Der · Eev-wicheyt.

Van Mieris, iii., p. 415 ; Neumann, No. 35,321 ; P. and R., p. 17, No. 11.

Neumann attributes this jeton to Brussels.

(To be continued.)

DIFFERENTIAL DIAGNOSIS OF CHOLERA BACILLI.—Cahen has drawn attention to another useful test for the recognition of the cholera germ, based upon the reducing power of the germ. The suspected colonies, which under the microscope are found to consist of bent rods, are transferred from the plate culture to an alkaline bouillon colored with litmus solution and kept at 37° C. If the culture fluid becomes decolorized in twelve to twenty-four hours, it shows the presence of the cholera bacillus.—*Zeitschr. f. Hygiene*, 2, 386.

EDITORIAL NOTES AND COMMENTS.

ATTENTION is particularly invited to our CHANGE OF ADDRESS. *All* correspondence, exchanges, and publications should be addressed :

113A Second Place, Brooklyn, N. Y.

HOW CAN WE PROTECT OURSELVES AGAINST POLLUTED WATER?

THIS question is suggested by the leading article and by the *Health Officers' Reports*—particularly that of the Secretary of the State Board of Health of New Jersey—in this number. Not that these contributions are any more significant than much that has heretofore appeared in our pages on the prevalence and danger of using polluted water, but with the hope of intensifying interest in the subject and of emphasizing the importance of using protective measures.

It is remarkable, in this connection, that, notwithstanding the now well-nigh universally accepted truth that polluted water is the most fruitful of all causes of preventable disease, it was not until the second visitation of cholera to London, in 1849, and after it had destroyed upward of fourteen thousand lives, that Dr. John Snow saw reason sufficient to justify him in urging attention to polluted water as the chief means by which the disease was propagated. But it required a second visitation, and the destruction of many more lives, in 1854, and his continued urging, before other physicians and the public became sufficiently convinced of the soundness of his judgment to take active measures against the pollution of the water supplies, as the most effectual measure of preventing it. And it is only since this knowledge has become generally accepted that the British sanitary officers in India have become thoroughly alive to its truth ; not alone with regard to cholera, but of other fatal diseases in India, as in the United States and other countries. This is the more surprising, in India particularly, because from recent investigations it appears that the inhabitants of that country have been the foremost among ancient civilizations in protecting the water supplies. Dr.

M. C. Furnell,* long a resident in India, has recently published that—

“ When the inhabitants of England were rude savages, running about naked, or nearly so, having few or none of the civilized arts of life, the ancient people of this country [India] were far advanced in the profession and practice of medicine, and coeval with that time had laid down rules regulating the use and conservancy of water. . . . In the second book of Ramayana, the great epic poem of the Hindus, Prince Barata calls down upon himself a curse if he were guilty of something charged against him by saying :

“ ‘ His sin, who deadly poison throws
To spoil the water as it flows,
Lay on the wretch its burden dread,
Who gave consent when Rama fled.’ ”

“ The sin of spoiling drinking water was evidently considered by Prince Barata as one of the greatest possible gravity, as rendering the man who did it fit only for the infernal regions.”

Notwithstanding, so neglectful have the people of India been of those ancient precepts and rules regulating the conservancy of water, that they are now almost as debased in this respect as the people of the United States. For the same writer cites numerous instances where the wells and tanks built at great cost, giving an abundance of clear, sparkling, cool water, even in the hottest weather, formerly used exclusively for drinking, but now, owing to neglect, are defiled every day. The people now visit such wells for bathing their persons and washing their clothes ; and the water in which they have washed, instead of running right away, as originally intended by the construction, trickles back into the well, and is drawn up in chatties and taken home and drunk.

“ Lately,” Dr. Furnell says, “ when the cholera was making its way down from the Northwest to our Presidency, . . . I found myself inspecting a municipality in the North. . . . I was going round the town, when the manager pointed out in the distance a bank which, he said, was the bund of a tank in

* Cholera and Water in India. By M. C. Furnell, M.D., F.R.C.S., Companion of the Indian Empire ; Fellow of Madras University ; late Surgeon-General and Sanitary Commissioner, Madras, etc. Pamphlet, 1887. J. & A. Churchill, London.

which washing of clothes and bodies was *strictly* prohibited. 'Oh,' I said, 'let us go and look at it!' We went. The doctor of the station, as well as the manager of the municipality, was with me. We were soon there, and it was certainly a magnificent tank. . . . There were crowds of people at all four sides, *and all or nearly all busily engaged washing their clothes, and those that were not doing that were bathing their bodies!* Just where we had reached the tank was an old man washing a not very clean cloth, and when he had done, he washed himself and spat repeatedly in the water. He then went away, and within a minute a woman came there, stood almost in the identical spot the old man had stood a minute before, and filled two bright brass chatties with the water, and took them home for drinking and cooking. She must of necessity have taken home some of the filth from the old man's clothes and a portion of the spittle to drink and cook with! What a repulsive idea! Now, what we had just seen passing under our eyes was taking place at various times of the day all round the tank, and not only all round this tank, but around hundreds and thousands of tanks which lie scattered over this fair continent of India. . . .

"To my mind," he remarks, "there is something singularly repulsive, putting aside all idea of epidemics, in the notion of drinking water in a portion of which your neighbor has just been washing his clothes and even his body."

But what is this to the *thousands of tons of ordure* poured into the Passaic River—the drinking water of well-nigh half a million of people—so cogently described by the Secretary of the State Board of Health of New Jersey, already referred to? or to the Croton drunk by New York's million and a half of people, whose tributaries are the receptacles of the drainage of hundreds of farm-yards, cow stables, piggeries, mills, and hotels, which swell the streamlets with the filthiest of all filth? These are only examples of large communities, of which many more might be cited equally subject to such conditions; and hundreds—ay, even thousands of small communities throughout the country, more numerous than those which congregate around the water tanks of India, could be designated, and—accepting the effects on the health of the people—with equally fatal results.

We are, of course, conversant with the views of some apologists for the tolerance of this filthy practice—that polluted water is speedily self-purified and restored to its original elements; but the *effects*—to all who will interest themselves in the morbidity and mortality statistics of such communities—prove the contrary. Moreover, all such doubters should diligently read the leading article of this number.

But how can we protect ourselves?

Among the citations of the laws and regulations of the ancient lawgivers of India, cited by Dr. Furnell in the pamphlet before referred to, is this:

“In Uddhava Gita of the eleventh book of the Bhagavata Purana, or Krishna’s legend, the pious old Uddhava is advised by Krishna to drink no other water but that filtered or strained through a clean cloth.” And among these people there are still some who obey this precept.

There is an order of mendicants of one of the most ancient, most numerous, and—in one thing at least—most wise of religions, in India and Ceylon, who believe it to be a sin to do any kind of work except to mend their clothes and shave their beards. Their vows restrict them to but one meal a day, and that of the plainest food, which has to be eaten before noon, and to the possession of only *eight* things of this world’s goods as necessary to their religious life. These eight articles are: Three articles of clothing, one belt, a wooden bowl to hold the food which is given them, one razor, one needle with which to mend their clothes (which consist of rags), and one *water filter*.

It is remarkable that the word “Buddha” (Buddhism being the religion here referred to) means “the Wise”—and certainly so is the practice of his followers in filtering their drinking water. Hence, it seems probable that twenty-five centuries ago, in India, when and where Buddhism arose, the wise had a much clearer recognition of the danger of drinking impure water than the modern inhabitants of that country or the more enlightened of other countries now have—not by any means excepting the people of the United States.

We are not informed of the *kind* of filters used by this people, but it seems altogether probable that their knowledge of the necessity of filtering the water cultivated the art of con-

structing them. Nor is it necessary that we should, in this connection, undertake to elaborate this subject. Our purpose is, as before stated, to emphasize the *importance* of using filters.

Water filters exist in great variety, all based, in the first place, on the simple principle of passing the water through some porous substance, the interstices of which are too small to admit of the passage of the solid particles held by it in suspension. But as the particles held in water are immeasurably small, the pores must be extremely minute. Moreover, it is of the utmost importance that the material of which the filter consists should be entirely insoluble, and capable of being frequently cleansed with the utmost facility. Charcoal, animal as well as vegetable, more or less compressed, or mixed with various proportions of sand, has long been deemed a favorite substance. But all filters are more or less likely to become foul by use, and those constructed of this material on becoming so are exceedingly difficult to cleanse, and are consequently speedily rendered troublesome or unfit for further use. Sponge, variously compressed, is only a strainer, at best, and wholly unreliable. Porous stone, both natural and artificial, of various degrees of texture, has been extensively used in recent years, and with greatly improved results. Of such, in particular, is the "Gate City Stone Filter," which uses a natural stone. It is put up in several varieties—china, glass, and stone—and we are satisfied from personal observation that it comprehends the best requirements. Professor J. J. Browne, of Syracuse University, Syracuse, N. Y., after using one continuously in his laboratory for several months, writes: "I have thoroughly tested it. The foulest water I could obtain was first passed through the filter and afterward examined with the microscope at intervals for a number of days without detecting the least trace of animalcule.

"Its decolorizing power is easily shown by filtering ink, iodide of starch, iodide of mercury, etc. I think that many who have witnessed these experiments are convinced that it has no equal.

"The ease with which it is cleansed (so obvious to all) is superior to every filter of which I have any knowledge."

"The Hyatt Pure Water System" is also highly spoken of by many who have made use of it—chiefly on a large scale, to

which it appears to be especially adapted. The material used in its construction is sand and coke, and alum is added to the water as a coagulant. The claim made for it is, that it first purifies the water by coagulating the impurities and afterward filters it, and that the coagulant is precipitated. This is disputed by some persons on the ground that the amount of alum necessary to remove the impurities cannot always be so nicely adjusted as to insure its total precipitation in the coagulum on the filter through which the water percolates. But the Committee of the Chemical Section, acting as a subcommittee of the Committee on Science and the Arts of the Franklin Institute, Philadelphia, to which "The Hyatt Pure Water System" was referred for examination last year, have recently reported in favor of it, and endorse its adaptability to the purification of the water supplies of cities.

The filter bed requires daily cleansing, but for this ample provision is made by a reversal of the current of water, and the process can be effected with great facility.

Opinions differ with regard to the effect of filtering on soluble matter, except with *new* charcoal filters. It is generally conceded that fresh charcoal acts powerfully upon organic matters in solution, but the extent to which this power is retained in the charcoal of a filter in continuous action has not been satisfactorily ascertained. It is always best to *boil* drinking-water suspected of containing organic matter in solution, and filter it afterward. The filtering in this case restores the air to the water of which it is deprived by boiling.

SUMMER HEALTH SERVICE.—The Boards of Health of both New York and Brooklyn have, as usual, appointed special inspectors during midsummer to look after and report upon the results of their neglect of overcrowding in tenement houses; notwithstanding they have all along had plenary power for its prevention, and had no reason to think that July and August would not, as always in these latitudes, intensify the effects of such neglected conditions.

Effects are a more or less common revelation of their cause in everything, but in nothing more than in disease; and it would be difficult to find a better example of an adequately revealed cause of increased sickness and death than that which

is annually permitted by the health authorities in these cities, in the face of patent knowledge. Indeed, the continuous dealing with the effects of criminally neglected causes is no less the bane of these powerful boards of health than of the thousands of weakly boards throughout the country without executive authority, who have to rely upon the perceptions of the civil authorities to whom they are beholden to define and abate a nuisance.

The same role has been enacted hereabouts for a dozen years, and its revelations published as a chief merit—that for about two months only every year—disease has been sought before its fatal issue has been reported. Surely there is no one in the health service of these communities so wanting in intelligence as not to know that the effects of overcrowding and filthy surroundings on health is greatly intensified by high temperature. Yet the *effects* are annually awaited, thousands of lives are wasted, and indescribable distress imposed upon the helpless poor in default of *preventive* measures for which the tenement-house laws amply provide, and which the health authorities are duly authorized to execute.

THE AMERICAN CLIMATOLOGICAL ASSOCIATION.

The fifth Annual Meeting of this association will be held in Washington, D. C., September 18th, 19th, and 20th, 1888, in connection with the Congress of American Physicians and Surgeons.

The preliminary programme is as follows :

The first session will be held Tuesday, September 18th, at 2 P.M. Following which there will be morning and afternoon sessions on Wednesday and Thursday.

The President has appointed Drs. F. H. Bosworth, of York, and E. C. Morgan, of Washington, a committee to provide a banquet to be held Wednesday evening, to which all the members intending to be at the meeting are invited to subscribe.

The following papers and discussions have been arranged for, and others may be added to the list :

The President's Address, Dr. A. L. Loomis, New York ; "The Relation of High Altitudes to Germ Disease," Dr. S. A. Fisk, Colorado ; "Is Climate an Etiological Factor in

Graves' Disease," Dr. R. G. Curtin, Philadelphia ; "An Environment Experiment Reported," Dr. E. L. Trudeau, Saranac Lake ; "Invalids Suited for Treatment at Colorado Springs," Dr. S. E. Solly, Colorado ; "Influence of Semi-Tropical Latitudes on Types of Disease," Dr. John Guiteras, Charleston.

Discussion : "The Relative Importance of Different Climatic Elements in Treatment of Phthisis," Dr. E. T. Bruen, Philadelphia, and Dr. V. Y. Bowditch, Boston ; "Observations on the Use of Terebine," Dr. D. M. Cammann, New York ; "Climate and Bright's Disease," Dr. J. C. Wilson, Philadelphia.

Discussion : "The Mineral Waters of the United States ; Therapeutic Value as Suggested by their Chemical Composition," Dr. A. C. Peale, Washington ; "Their Therapeutic Value in Gastro-Hepatic Diseases," Dr. William Pepper, Philadelphia ; "Their Therapeutic Value in Urinary and Arthritic Diseases," Dr. A. H. Smith, New York ; "Their Therapeutic Value in Malarial Diseases," Dr. J. C. Van Bibber, Baltimore.

Report on Mineral Springs, Dr. C. C. Rice, Chairman, New York ; "Interpleural Pathological Products ; their Cause, Significance, and Special Relationship to Pulmonary Phthisis," Dr. J. R. Leaming, New York ; "Conditions which Tend to Render the Atmosphere of a Locality Aseptic," J. T. Whitaker, Cincinnati.

Discussion : "Influence of Altitude on Cardiac and Pulmonary Diseases," Dr. F. Donaldson, Sr., Baltimore, and Dr. J. J. Levick, Philadelphia ; "Climatic Characteristics of Texas," Dr. Morse K. Taylor, U.S.A., San Antonio ; "Therapeutic Differences of Mountain and Sea Air," Dr. W. H. Geddings, Aiken ; "Indications and Contra-indications for Altitude in Treatment of Phthisis," Dr. F. I. Knight, Boston ; "Discussion of the Nasal and Neurotic Factors in Etiology of Asthma," Dr. F. H. Bosworth, New York, and Dr. E. L. Shurly, Detroit ; "Therapy of Climate," Dr. I. H. Platt, Lakewood ; "Therapy of Ocean Climate," Dr. A. L. Gihon, U.S.N. ; "Climatic Characteristics of Roan Mountain, Eastern Tennessee," C. J. Kenworthy, Florida ; "Notes of Summer in Switzerland," Dr. D. B. St. John Roosa, New York ; "An Epidemic of Cerebro-Spinal Meningitis in Central New

York," Dr. W. T. Ford, Utica ; " Further Contribution to the Study of Consumption Among the Indians," Dr. W. Matthews, U.S.A.

A. L. LOOMIS, M.D., LL.D., *President.*

J. B. WALKER, M.D., *Secretary.*

TRIBUTE TO DR. LEWIS A. SAYRE.—On the natal day of the eminent physician and surgeon, Dr. Sayre, of New York, February 29th, 1888, one of his friends presented him with an elegant book, " Masterpieces of Modern Painters," containing engravings from well-known pictures, with the following poetical tribute :

Accept this book, dear Dr. Sayre,
To celebrate your birthday rare,
For natures grand and great as thine
Can have but two birthdays in nine ;
For men so full of skill and cheer
As you—are not born every year.

No instrument more bright and keen
In any case was ever seen
Than thy bright wit, as sure to last
As in the strongest plaster cast,
Fitting as well in every place
To add to human form new grace.

Your science makes the crooked straight,
From heavy-laden lifts the weight,
Blesses the sorrowful and ill
With open purse and wondrous skill,
Uplifts the lowly, leads the lame,
And crowns you with a noble fame.

So when, in after time, you look
Upon the pictures in this book,
May sweetest thoughts around you gleam,
As charming " as a poet's dream ;"
Wishing you blessings without end,
I sign myself your faithful friend.

M. G.

The Bayoune Herald, April 21.

PHOTOGRAPH OF THE LATE DR. CORNELIUS R. AGNEW.


At the last meeting of the Ophthalmological and Otological Section of the New York Academy of Medicine, the following motion was made and carried :

" That a committee be appointed, of which the chairman of

the section, Dr. David Webster, be a member, whose duty it shall be to obtain a good photograph of the late Dr. Cornelius R. Agnew, for the purpose of having engravings suitable for framing made from this. The right of issue and sale of such engravings shall be given to some first-class publisher, if practicable ; if not, the committee shall offer them to the profession at cost."

In accordance with the above, a committee has been appointed. Members of the profession who desire such an engraving accompanied by an autograph signature, should send their names and addresses to the Secretary of the Committee, Dr. Charles H. May, 640 Madison Avenue, New York City, at once. When all such names shall have been recorded, those who have requested a copy of the engraving will be notified of the cost of the same, either by the publisher or by the committee having the matter in charge.

STATE AND LOCAL BOARDS OF HEALTH REPORTS OF DISEASES AND MORTALITY IN THE UNITED STATES AT THE MOST RECENT DATES.

 It would greatly add to the interest of the reports under this head if all correspondents would give the ratio of the *death-rates per 1000 of population per annum*, by which different populations could be compared.

ALABAMA.—*Mobile* (40,000). The Health Officer reports 73 deaths during May, 1888, of which 20 were under five years of age. Annual death-rate per 1000, 22.20. From zymotic diseases there were 17 deaths, and from consumption, 11.

CALIFORNIA.—The Secretary of the State Board reports the number of deaths during May, 1888, from 90 localities, comprising a population of 723,950, 1035, representing an annual death-rate of 16.8 per 1000.

Consumption is credited with 174—16.8 per cent of the total mortality. Pneumonia, 72 ; bronchitis, 25 ; congestion of the lungs, 14.

Zymotic diseases, 116 : Diphtheria (including croup), 48 ; typhoid-fever, 28 ; cerebro-spinal fever, 14 ; scarlet-fever, 9 ; measles, 7 ; remittent and intermittent fevers, 4 ; whooping-

cough, 2 ; typho-malarial fever, 1 ; *small-pox*, 2—both in San Francisco, where 8 cases were reported during the month ; 8 were also reported in Los Angeles, 1 in Stockton, and 2 in the mountains, about ten miles from Cloverdale.

San Francisco (300,000—Caucasian, 278,000 ; Chinese, 22,000), deaths, 504—141 under five years. From zymotic diseases, 68 (of which one only was of a Chinese) ; diphtheria, 21 ; typhoid-fever, 12. Consumption, 75 ; pneumonia, 39 ; from other lung diseases, 36. Death-rates, white, 19.8 ; Mongolian, 24.

Los Angeles (70,000), 60 ; from consumption, 11 ; acute lung diseases, 3.

Oakland (50,000), 67 ; from consumption, 9 ; acute lung diseases, 7.

San Diego (32,000), 42 ; from consumption, 7 ; acute lung diseases, 3.

Sacramento (30,000), 42 ; from consumption, 10.

CONNECTICUT.—The Secretary reports for May, 1888, the total number of deaths returned by 135 towns, comprising a population of 680,428, 983, representing an annual death-rate of 17.13. Deaths under five years 183—18.4 per cent.

“ There is a notable reduction of mortality from diseases of the pulmonary organs as compared with the months preceding ”—consumption, 139 ; acute lung diseases, 167—“ but there is marked increase in the fatality of the infectious diseases ”—153, as follows : Small-pox, 2 ; measles, 3 ; scarlet-fever, 13 ; cerebro-spinal fever, 22 ; diphtheria (and croup), 50 ; whooping-cough, 3 ; erysipelas, 1 ; typhoid-fever, 17 ; malarial-fever, 16 ; typho-malarial fever, 2 ; puerperal-fever, 7 ; diarrhœal diseases, 17. “ Deaths from heart diseases were also much more numerous (92) than in April.”

The *lowest death-rates* of the 28 towns with 5000 inhabitants and upward were in Vernon, 7.5 ; Groton, 9.3 ; Winchester, 10.6 ; Windham, 12 ; Putnam, 12.3.

The *highest death-rates* of the 28 towns with 5000 inhabitants and upward were in Enfield, 24 ; New London, 22.1 ; Bristol, 20.5 ; Norwalk, 20.2 ; Waterbury, 20.

DELAWARE.—*Wilmington* (57,000) reports for May, 1888, 104 deaths, of which 45 were under five years of age. Annual

death-rate per 1000, 21.8. From zymotic diseases there were 61 deaths, and from consumption, 14.

ILLINOIS.—*Quarterly Meeting of State Board*, June 28th–29th, 1888. The Secretary reports 9 importations of *small-pox* into the State during the year without any spread of the disease; “the outbreaks thus far have been promptly suppressed, with only one exception. The 2 cases in Bond County, at Greenville and at Reno—existing at the date of the last report in April—caused no others in the neighborhood, and up to the latter part of May the State was free from the disease. May 26th 3 cases were reported at Metropolis, in Massac County, among some negroes. The contagion was introduced by a steamboat from Paducah, Ky. The Health Officer of the town contracted the disease, but aside from this there was no other case outside the family first infected.”

Medical Education and Statistics are discussed at considerable length, and the Secretary refers with just pride to the general recognition, both in this country and abroad, of the leading action of the Illinois State Board of Health in this regard.

The Medical Practice Act continues to be scrupulously enforced throughout the State. “It is now one year since the new law went into effect, and nearly all who were required to take out certificates have done so. The effect of this law, especially with regard to itinerant showmen and mountebanks who sold medicines, has been marked and gratifying. . . . It is perfectly safe to assume that this law has saved the people of the State not less than \$250,000 during the past year.”

Chicago (760,000) reports 1189 deaths during May, of which number 465 were under five years of age. Annual death-rate, 18.77 per 1000.

From zymotic diseases there were 218 deaths, and from consumption, 135.

IOWA.—*Monthly Bulletin* for June, “the official publication of the State Board of Health,” makes no report for the preceding month, but promises “during the year beginning with next month [July] to present each month reports showing the

marriages, births, and deaths annually in eight or ten counties of the State, so as during the year to present a record for each county within the State, if possible. These reports will give the total number of deaths, as well as a few of the principal causes."

LOUISIANA.—*Biennial Report of the Board of Health to the General Assembly of the State, 1886-87*, Joseph Holt, M.D., President, pp. 147. About half of this pamphlet is taken up with that portion of the health service of Louisiana with which our readers have already been made familiar—the principles and practice of port sanitation, and the admirable apparatus by which it has been rendered exceptionally effective. But with regard to the rest, Dr. Holt very justly remarks :

"One scarcely realizes the amount of labor involved in keeping the streets of New Orleans in repair, and the inadequate makeshifts in vogue to meet the requirements demanded so urgently. The very nature of our soil precludes the possibility of our having serviceable roadways without the introduction of other material more cohesive and substantial." Of 590 miles of roadway, 470 are dirt roads, 41 cobble-stone, 23 square block granite, 18 ballast, 26 shell, 7 asphalt, and 5 plank. And with regard to *drainage* :

"Language fails to convey an idea of the utterly neglected state of the drainage of New Orleans. For years the system has been that of open gutters conveying the storm water and such refuse as this accidental and irregular flow facilitates into canals in the rear of the city, where drainage wheels cast it through outlets into Lake Pontchartrain. The intermittent action of storm waters has been supplemented to considerable extent by the flushing process inaugurated by the New Orleans Auxiliary Sanitary Association, and in many instances, were the grade of gutters regulated and deposits from street bridges removed, this service would prove of incalculable benefit ; but as it is at present the flushing pumps cannot work to full capacity on account of the irregular state of the former and the choked condition of the latter. The drainage canals, filled with the accumulation of refuse matter, are totally unfit to receive the flow into them, and are disgusting masses of liquid filth which, festering under the influence of

our long summers, continually threaten the health of our people. Their condition causes overflow of our streets, because storm water cannot find immediate discharge, and the past two years have witnessed more frequent submerging of streets and banquets than has been observed for many years previous. The natural result has been a saturated condition of the soil, dampness of houses, and the production of diseases incident to these causes. In numerous instances business has been suspended on account of the inability of pedestrians to go from one place to another on account of overflow."

Such was the condition so cogently referred to by Professor Chaillé, under the head of *Public Filth is Public Disgrace*, in our June number, and which we are gratified to learn, through the newspapers of New Orleans, has had the effect of rousing the public spirit to such a degree as to wipe out—temporarily at least—the public disgrace which at that time obtained. But this, after all, must be regarded as only a makeshift, though a very magnanimous one—the raising of \$40,000 by voluntary subscription to cleanse the city.

Filth storage still goes on, and despite the best possible construction of the receptacles urged by Dr. Holt, no one was more sensible than he was of the constant danger menacing the city from this cause, notwithstanding the excellence of the port sanitation. New Orleans' most deadly and devastating enemy, yellow-fever, still threatens, and the more by reason of its recent planting on the Gulf side of Florida. Yet her people seem to prefer a continuous accumulation of filth and occasional spasmodic efforts for its removal to an effective sewerage system. Nine years ago, on the eve of a yellow-fever visitation, they were more alive to the importance of sewerage and drainage than they now appear to be. Possibly nothing less than the impoverishment of another epidemic of yellow-fever will arouse them to the appreciation of the equal importance of internal hygiene with external—upon which they now base sole reliance.

The report before us exhibits a large amount of sanitary service, eminently necessary from the extraordinary necessities of the case; and, considering the circumstances, with results eminently creditable to the health authorities.

1886: Estimated population—white, 173,500; colored,

64,500 : 238,000. Deaths : White, 4092 ; colored, 2199 : 6291.

Death-rates : White, 23.59 ; colored, 34.09 : 26.43.

1887 : Estimated population—white, 176,500 ; colored, 66,250 : 242,750. Deaths : White, 3947 ; colored, 2128 : 6075.

Death-rates : White, 22.36 ; colored, 32.12 : 25.02. Of the total mortality, more than one half was of children under five years of age ; over 40 per cent from zymotic diseases, and 12.43 from consumption. These proportions abundantly illustrate the effects of preventable causes.

New Orleans (248,000—white, 180,000 ; colored, 68,000) reports for the month of May 381 deaths among the whites and 222 deaths among the colored ; showing the respective death-rates to be 25.40 and 39.17, and the rate for total population, 29.17. There were 329 deaths under five years of age. From zymotic diseases there were 137 deaths, and from consumption, 58.

MAINE.—*Third Annual Report of the State Board of Health* for the fiscal year ending December 31st, 1887, pp. 336. The progress of practical sanitation in this State is well shown in the report before us by the increase in the number of local boards of health, though the act for their establishment only went into effect in April, 1887 ; the attention given to water analysis, school-house sanitation, sewerage and drainage, and domestic sanitary improvements. The law provides that there shall be a local board of health in each city and town in the State, anything in the charter of such city to the contrary notwithstanding ; and provides for the appointment of a health officer who shall be a well-educated physician, by the municipal officers, as sanitary adviser and executive officer of the board, and hold office during the pleasure of the board. The local boards are endowed with ample powers, and the health officers are required to report to and co-operate with the State Board. Upward of four hundred local boards had been organized at the end of the nine months during which the law had been operative, and most of them show by the abstract of their reports a praiseworthy appreciation of the first necessities in the promotion of the public health—a pure water supply and protection against infectious diseases by cleanly surroundings.

The Secretary submits a tabulated exhibit of the first three and a half months' laboratory work in *water analysis*, which, notwithstanding his statement that the water supply of the State is, upon the whole, probably better than that of any other in the Union, suggests that the extensive use of polluted well water is a prolific source of disease there as elsewhere. He also submits the results of his personal *inspection of some of the school-houses* of the State, to which he has devoted much of his time. The prevailing defects are, in the order of their greatness, deficient ventilation, insufficient or badly placed light, poor heating apparatus, bad construction, overcrowding and filth storage. Nothing is said of the potable water. As an indication of the air pollution, the proportion of carbonic in numerous rooms tested was found to vary from $8\frac{1}{2}$ to 29 parts in ten thousand. There is evidently much room for improvement.

Motives and Methods of Sewering Cities, Villages, Towns, and Summer Resorts, and for Domestic Sanitary Improvements, House Plumbing, etc., is the subject of a special report by E. C. Gordon, C.E., member of the board: an instructive paper, illustrated with some of the worst substitutes and some of the best appliances for house drainage; a concise statement of the benefits of sewerage and the importance of thorough constructive work in all plans.

MARYLAND.—*Baltimore* (437,155) reports 544 deaths for the four weeks ending May 26th, of which 197 were under five years of age.

Annual death-rate per 1000, 16.18. From zymotic diseases there were 44 deaths, and from consumption, 89.

MASSACHUSETTS.—*Boston* (400,000) reports 820 deaths during May, of which 269 were under five years of age. Annual death-rate per 1000, 24.6. From zymotic diseases there were 108 deaths, and from consumption, 134.

MICHIGAN.—For the month of May, 1888, compared with the preceding month, the reports indicate that consumption and measles increased, and that influenza and neuralgia decreased in

prevalence. Compared with the preceding month, the temperature in the month of May, 1888, was much higher, the absolute humidity much more, the relative humidity about the same, and the day and the night ozone slightly more. Compared with the average for the month of May in the nine years, 1879-87, measles were more prevalent, and intermittent-fever, remittent-fever, diphtheria, consumption of lungs, and diarrhœa, were less prevalent in May, 1888. Compared with the average of corresponding months in the nine years, 1879-87, the temperature was lower, the absolute humidity was less, the relative humidity was slightly more, the day and the night ozone were much less. Including reports by regular observers and others, diphtheria was reported present during the month at 23 places, scarlet-fever at 54 places, typhoid-fever at 14 places, measles at 64 places, and small-pox at 1 place. Reports from all sources show diphtheria reported at 3 places more, scarlet-fever at 11 places more, typhoid-fever at 1 place less, and measles at 19 places more in the month of May, 1888, than in the preceding month.

Detroit (220,000) reports 343 deaths during May, of which 77 were under five years of age. Annual death-rate, 18.35 per 1000. From zymotic diseases there were 58 deaths, and from consumption, 36.

MINNESOTA.—*Public Health*—the official bulletin of the State Board of Health—reports for May, 1888: Diphtheria, 48 cases, 20 deaths; and scarlatina, 10 cases, 2 deaths.

"*Small-pox* continues to spread slowly, . . . two outbreaks in May. At this date, July 5th, the last case in both localities has recovered, and there appears to be no further danger in either place. . . .

"A study of the death-rates, by specified diseases for 1888 to May 1st, gives the following conclusions:

"Measles, increasing. Scarlet-fever, increased, with a decline in April. With both diseases cases have been sporadic and few. Diphtheria increased steadily from March, 1887, till in December there were 136 deaths; 1888 began with 103 cases in January; February had 65; March, 51; and April, 59; a marked and continued decline. Typhoid-fever: January, 51 cases; February, 33; March, 31; April, 29.

The disease increased regularly from February, 1887, to November. Then began a steady decline which continues May 1st. Erysipelas and puerperal diseases: Though few cases, there is a greater number than in any quarter of 1887. Diarrhœal diseases: Few in number, but more than in same period of 1887. Bronchitis: Not much different from same quarter in 1887. Pneumonia: More deaths than in last quarter of 1887, and more than in first quarter of 1887."

St. Paul (150,000) reports 167 deaths during May, of which 94 were under five years of age. Annual death-rate per 1000, 13.33. From zymotic diseases there were 20 deaths, and from consumption, 15.

MISSOURI.—*St. Louis* (440,000) reports 655 deaths during the month of May, of which 230 were under five years of age. Annual death-rate per 1000, 17.9. From zymotic diseases there were 109 deaths, and from consumption, 71.

NEW JERSEY.—Eleventh Annual Report of the State Board of Health, and Report of the Bureau of Vital Statistics, 1887, pp. 478. E. M. Hunt, M.D., Secretary. The leading characteristic of this report is the number and excellence of its essays and local boards reports on special subjects of practical importance. The report of the Secretary, with which it opens, gives a general review of the always uppermost subjects—drainage of the soil, the disposal of wastes, protection of the water supply, house connections of gas and water-pipes, communicable diseases and their prevention. This is followed by an essay on the Legal Aspects of the Pollution of Streams, by E. S. Atwater, councillor at law, defining the powers and duties of the Board of Health in the premises, and advising an increase of authority. Professor A. R. Leeds, Ph.D., reports upon the Water Supply of Communities Drawing their Supply from the Passaic Water-Shed, in which he gives the results of the analyses of numerous samples without note or comment. Two samples collected June 27th, from the Passaic below the Great Falls, in order to determine the character of the water after receiving the sewage of Paterson, under gelatine-peptone cultures: No. I., after twenty-three hours, contained 38,160 colonies, and No. II., after twenty-one

hours, 33,120 colonies per cubic centimetre. "These colonies were demonstrated by means of separate microscopic examinations, aided with appropriate staining fluids, to consist of various species of bacteria, bacilli, and micrococci, the last named being especially numerous in the second sample." These appear to be fair specimens of numerous other samples taken just below Paterson and at the in-takes of Jersey City and Newark water supplies, not in all cases containing so large a number of bacteria, but in general great numbers.

Chemically, the following is selected as fair specimens of many :

"No. XXIX., from the Passaic River above the Great Falls.

"No. XXX., from the Passaic River below the Great Falls.

"No. XXXI., from the Passaic River at Little Falls.

"The first and last had but little, if any, taste or smell ; that taken from the Passaic after receiving the Paterson sewage was disagreeable in both respects.

	XXIX.	XXX.	XXXI.
	Grains per gallon.		
Free ammonia.....	0.0029	0.0093	0.018
Albuminoid ammonia.....	0.0076	0.013	0.012
Required oxygen.....	0.23	0.39	0.24
Chlorine.....	0.35	0.44	0.35
Hardness.....	2.44	2.79	2.68
Nitrites.....	None.	0.00011	Trace.
Nitrates.....	0.022	0.036	0.022
Total solids....	4.08	4.95	5.07

	Volume per cent.		
Oxygen.....	0.657	0.46	0.56
Carbon dioxide.....	0.109	0.19	0.07
Nitrogen.....	1.365	1.45	1.23

"In order that it may not be overlooked, I desire to call attention to the percentage of dissolved oxygen in the sample taken below the Great Falls, as compared with that in the others.

"The sample taken below the Great Falls yielded 11,500 colonies of microbes per cubic centimetre ; the sample taken from above the Great Falls, 5760 colonies ; that from Little Falls, 4800 colonies."

Dr. E. M. Hunt, the Secretary, also contributes a paper on the Passaic River as Related to the Water Supply and Death-Rates, in his Report on Vital Statistics, at which he states :

"As we turn to the banks of this river below Little Falls, we find at Paterson about 60,000 people besides all other animals and all other sources of befoulment ; at Passaic, 9000 ; at Newark, 160,000, with a population in Jersey City and suburbs of 200,000, receiving the same supply. With this is to be reckoned some of the scattered populations along the banks, as well as pollutions from Saddle River and the towns along Third River and those along Second River, as well as what is carried up by the tides.

"Paterson has about thirty miles of sewers. The flow of Passaic City is to the river, and they are now proposing to build sewers to conduct it more directly.

"The Third River bears into the Passaic the refuse of the several factories and of the Morris Canal, as well as some of that of the scattered population near it. All this enters about one mile and a quarter above the Newark in-take.

"The Second River brings down the sewage of Orange, Bloomfield, and other towns and villages in close proximity, and empties about one quarter of a mile below the Jersey City in-take.

"In addition to all this, the sewage of the city of Newark, to a serious degree, is forced up above the Jersey City in-take, and so as also to affect the parts above Newark in-take.

"The more the facts have been examined into, the more it appears that the sewage of 250,000 people, with all that it means as to other refuse, garbage, etc., is likely to find its way into the Passaic River. The flow of the Passaic River is stated by Howell and Croes (p. 35) as 126,334,000 gallons per day at Paterson when the streams were low (October, 1878), so that as to the water of Jersey City, one of the chemical experts (Professor A. R. Leeds) says : "I am within the limit when I state that fifty per cent, or one half of the organic matter in the Jersey City water during the year 1884, was sewage." More recent analyses have shown increased pollution.

* * * * * * *

"When we compare with the average death-rate of the State for the past nine years, we find an excess in Newark and Jersey

City of such a proportion to each thousand of inhabitants, as means the loss of hundreds of lives. Besides, in this we are comparing in the aggregate with a general death-rate which is in itself higher in some localities, probably because of conditions of water supply similar to these cities. No one claims that there should be a death-rate anywhere in this State of over fifteen per thousand, and theoretical calculations even reduce the normal rate to twelve per thousand.

“ Our first five years of death record, from July 1st, 1878, to July 1st, 1883, gave a total death-rate for the State of 19.43 per 1000, that for Jersey City being 24.27 and that for Newark, 23.52, these being the two highest death-rates in the State.

“ When we come to inquire as to deaths of children and deaths from typhoid-fever and from diarrhœal diseases, under two years of age, we find 6625 children under five years of age died in this period in Newark and 6636 in Jersey City, or, in all, 13,261 ; total deaths at these ages for the State being 27,704. In other words, these two cities, with their 257,230 inhabitants, had nearly one half as many deaths at these ages as the rest of the State had with its 873,887 inhabitants. Is not that an arousing fact ? It is also to be borne in mind that even at this we are comparing with a State record which includes parts of Hudson County, Camden, and a few other considerable populations also known to have a poor water supply. A proper comparison would be with other populous cities having a good water supply, if we had enough of such large cities.

“ These two cities, with a little over one fifth of the population of the State, lost from typhoid-fever, $361 + 374 = 735$ out of the 2818, and from diarrhœal diseases, under twenty, $1774 + 1574 = 3348$ out of 11,768. There is here very marked excess of proportion. Since digestive and intestinal diseases of adults, and consumption and other diseases, are greatly affected by a poor water supply, it would be fair also, if we knew the proportion, to attribute the large excess in these diseases, to some degree, to poor water. But the figures already presented are enough to show that something very evenly and persistently secures to these cities a very high death-rate of these ages and from these diseases, such as would

put the water supply under suspicion more than any one known operating cause."

Outlines of Representative Sewer Systems, as in Operation in New Jersey, furnished or compiled from descriptions by J. J. Croes and F. S. Odell, George P. Olcott, C. P. Bassett, and Professor Charles McMillan, all Civil Engineers of good repute ; but, while the paper presents many points of practical importance in the systems described, it leaves the inference that sewerage in New Jersey is, to say the least, limited to narrow bounds, or the description of other and some better methods would be less conspicuous by their omission in this discussion.

Exposures and Diseases of Operatives in Workshops and Factories, by David Warman, M.D., is a paper of much practical importance to numerous avocations. Abstracts of the Papers and Discussions of New Jersey Sanitary Association, though, for the most part, previously published, contain many points of practical importance, which also add interest to the Report.

The number of marriages, births, and deaths by townships and counties and totals for the State is given in detail. Totals : Marriages, 15,416 ; births, 27,340 ; deaths, 24,331. Rates per 1000 of population, census of 1885 (1,278,033) : Marriages, 12.06 ; births, 21.31 ; deaths, 19.04. Death-rate without cities of over 5000, 15.15.

Death-rates in the several counties : Hudson, 24.13 ; Essex, 21.59 ; Passaic, 20.76 ; Camden, 20.19 ; Union, 19.24 ; Mercer, 18.19 ; Bergen, 16.62 ; Monmouth, 16.45 ; Cape May, 16.20 ; Morris, 16.10 ; Gloucester, 16.05 ; Somerset, 15.90 ; Middlesex, 15.82 ; Atlantic, 15.30 ; Burlington, 15.29 ; Warren, 14.47 ; Cumberland, 14.08 ; Ocean, 13.54 ; Sussex, 13.21 ; Hunterdon, 12.85.

Of the total number of deaths, 5849 were of infants under one year, 3396 from one to five years : 38 per cent. Under twenty years, 11,375—46.75 per cent. From chief preventable diseases, 23.81 per cent.

"Of those dying under one year, 1714 died under one month, of which 1162 died in the larger cities. Of those dying under one year, 4121 died in the larger cities. Of the 9245 that died under five years, 6574 died in the larger cities.

Total death-rate from consumption for the State, as compared with total deaths, 15.01, the deaths being 2361 in cities and 1292 outside. Rates for short periods, or which deal with small numbers, are only approximate, since temporary causes may have been in operation, and small numbers do not eliminate or balance errors which practically disappear in large aggregates. The number of deaths before twenty, in proportion to the rest, are much more informatory as to local causes affecting health than the total deaths."

As a whole this report is one of the most instructive and valuable that has ever emanated from any State Board of Health in the United States. It is eminently worthy of the widest practical distribution.

Hudson County (270,232) reports 506 deaths during May, of which 189 were under five years of age. Annual death-rate, 22.4 per 1000. From zymotic diseases there were 98 deaths, and from consumption, 66.

NEW YORK.—Official *Bulletin* of the State Board of Health reports the total mortality from the returns of 127 localities, comprising a population estimated at 3,738,000, for the month of May, 9032; for May, 1887, it was 7528; for last month (April, 1888) it was 8129 (310 delayed returns being since received). The percentage of mortality under five years for these respective months is 32.1, 32.6, and 30.0. In each 1000 deaths there were from zymotic diseases for the respective months, 141.75, 153.65, and 150; of which 14.54, 18.85, and 13.95, respectively, were from diarrhoeal diseases; 6.65, 5.00, and 5.55 from typhoid-fever; 69.65, 71.70, and 54.70 from diphtheria; 30.75, 15.14, and 30.62 from scarlet-fever. No new cases of small-pox have been reported except from Newburg, Haverstraw, and Clarkestown, in Rockland County, and Hopkinton, St. Lawrence County. In each 1000 deaths there were 132.75 from consumption, and 194.60 per 1000 above five years of age. Of 127 reporting localities, the mortality for the month represents an annual death-rate per 1000 of 16.80.

Severally, the populations and death-rates, are as follows:

Maritime District.—New York City, 1,526,081, 25.88; Brooklyn, 757,755, 19.49; Gravesend, 5000, 26.40; New

Utrecht, 4742, 22.78 ; Long Island City, 21,000, 29.52 ; Newtown, 10,000, 26.40 ; Oyster Bay, 12,000, 14.00 ; Hempstead, 18,000, 15.34 ; North Hempstead, 8000, 9.00 ; Huntington, 8100, 19.24 ; Jamaica, 10,089, 14.00 ; Southold, 7267, 13.21 ; Sag Harbor, 3000, 8.00 ; New Brighton, 15,000, 16.00 ; Edgewater, 12,000, 23.00 ; Northfield, 7014, 25.70 ; Westfield, 7000, 18.57 ; Yonkers, 27,500, 16.68 ; Westchester, 6900, 13.91 ; Portchester, 4000, 6.00 ; Sing Sing, 6500, 15.38 ; New Rochelle, 5500, 21.81.

Hudson Valley District.—Albany, 98,000, 21.41 ; Troy, 65,000, 24.18 ; West Troy, 13,000, 19.39 ; Hoosick Falls, 6000, 16.00 ; Lansingburg, 10,000, 22.80 ; Green Island, 5000, 26.40 ; Greenbush, 8000, 19.50 ; Coxsackie, 4000, 9.00 ; Catskill, 4500, 34.66 ; Hudson, 10,000, 21.60 ; Kingston, 21,000, 22.28 ; Ellenville, 3000, 16.00 ; Marbletown, 4000, 9.00 ; Esopus, 4736, 15.23 ; Saugerties, 4000, 15.00 ; Poughkeepsie, 20,200, 20.79 ; Fishkill, 10,732, 12.00 ; Wappinger Falls, 5000, 9.60 ; Newburg, 20,000, 18.00 ; Port Jervis, 9500, 16.37 ; Middletown, 10,000, 21.60 ; Goshen, 4387, 24.60 ; Haverstraw, 7000 (?) ; Ramapo, 5000, 7.20.

Adirondack and Northern District.—Argyle, 3700, 16.22 ; Salem, 3500, 27.42 ; Fort Ann, 4267, 11.25 ; Fort Edward, 4880, 19.67 ; Glens Falls, 10,000, 20.20 ; Crown Point, 4287, 11.20 ; Malone, 9000, 20.00 ; Potsdam, 4000, 18.00 ; Ogdensburg, 11,000, 21.82 ; Gouverneur, 5500, 8.73 ; Ellisburg, 4811, 22.45 ; Plattsburg, 7000, 12.00 ; Watertown, 12,200, 32.45 ; Lowville, 3188, 22.50 ; Clayton, 4314, 25.12.

Mohawk Valley District.—Schenectady, 20,000, 15.60 ; Schoharie, 3350, 21.50 ; Cobleskill, 3371, 14.24 ; Amsterdam, 14,000, 18.89 ; Johnstown, 6000, 24.00 ; Gloversville, 10,000, 9.60 ; Little Falls, 7200, 15.00 ; Herkimer, 3000, 16.00 ; Ilion, 4200, 2.86 ; Utica, 43,000, 19.53 ; Rome, 12,045, 20.00 ; Boonville, 4000, 12.00 ; Camden, 3400, 21.18 ; Waterford, 5400, 31.11 ; Ballston Spa, 3200, 15.00 ; Saratoga Springs, 10,000, 28.80.

Southern Tier District.—Binghamton, 25,000, 21.60 ; Owego, 6000, 14.00 ; Candor, 4323, 13.90 ; Waverly, 3000, 20.00 ; Elmira, 25,000, 18.72 ; Horseheads, 3500, 10.28 ; Bath, 3500, 17.14 ; Corning, 8000, 21.00 ; Olean, 8000, 15.00 ; Jamestown, 14,000, 9.43 ; Westfield, 3000, 8.00.

East Central District.—Walton, 3540, 20.34 ; Delhi, 3000, 16.00 ; Cooperstown, 3000, 12.00 ; Oneonta, 7000, 10.29 ; Worcester, 3000, 4.00 ; Cazenovia, 4363, 16.50 ; Brookfield, 3685, 16.28 ; Hamilton, 3912, 18.40 ; Skaneateles, 4866, 19.67 ; Syracuse, 78,000, 23.54 ; Cortland, 9000, 16.00 ; Homer, 3000, 24.00.

West Central District.—Auburn, 26,000, 17.56 ; Groton, 3450, 10.30 ; Ithaca, 10,000, 8.40 ; Waterloo, 4500, 10.67 ; Hector, 5000, 7.20 ; Seneca Falls, 6000, 20.00 ; Manchester, 4000, 24.00 ; Phelps, 7000, 8.57 ; Canandaigua, 6300, 9.53 ; Geneva, 6,000 20.00 ; Penn Yan, 4500, 18.67 ; Batavia, 7000, 10.28.

Lake Ontario and Western District.—Oswego, 24,000, 20.00 ; Richland, 4000, 6.00 ; Fulton, 4000, 27.00 ; Clyde, 3000, 20.00 ; Lyons, 6000, 10.00 ; Newark, 3500, 10.28 ; Palmyra, 4800, 5.00 ; Rochester, 110,000, 18.28 ; Brockport, 4500, 18.67 ; Medina, 4000, 15.00 ; Albion, 5000, 16.80 ; Lockport, 15,000, 12.00 ; Buffalo, 230,000, 22.38 ; Tonawanda, 4900, 12.25 ; Amherst, 4578, 18.35.

Syracuse reports for the year 1887, total mortality, 1199—15.37 per 1000 (78,000) population. Three hundred and seventy-five, or 31.2, were of children under five years ; 190, or 17.5 per cent, were caused by zymotic diseases—chiefly : diarrhœal diseases, 80 ; diphtheria and croup, 38 ; typhoid-fever, 20 ; malarial-fever, 19 ; cerebro-spinal meningitis, 13 ; whooping-cough, 11 ; erysipelas, 11 ; measles, 9 ; scarlet-fever, 4—upon which the Health Officer remarks : “ During the year there have been reported 195 cases.” If there is no mistake in these figures, this mortality was exceedingly small. Deaths from consumption, 192—16 + per cent ; bronchitis, 46 ; pneumonia, 67 ; from other lung diseases, 16 ; pleurisy, 2.

“ The conditions attendant upon the diphtheria which prevailed during the whole year showed that while other conditions varied, there was a uniform condition of no protection of the house from the polluting air of drains. With but few exceptions all the cases occurred where there was no sewer.” It would be, at the least, equally interesting to know the domiciliary conditions of the large mortality from consumption and bronchitis ; conditions to which there is too little attention paid generally, and of especial interest to Syracuse,

considering the excellence of the health service and the low death-rate in the aggregate.

NORTH CAROLINA.—Official *Bulletin* for May (latest received) summarizes the diseases in the State for April, 1888, by counties—53 reporting—as follows :

Measles in 18 counties, 7 eastern, 10 middle, and 1 western. Pneumonia occurred in 16 counties, 4 eastern, 5 middle, and 7 western. Whooping-cough occurred in 13 counties, 3 eastern, 6 middle, 4 western. Dysentery occurred in 3 eastern, 2 middle, 4 western. Typhoid-fever occurred in 2 eastern, 5 middle, 2 western counties. Diarrhœa occurred in 2 eastern and 4 western counties. Mumps occurred in 2 middle and 2 western counties. Consumption is reported in only 3 western counties. Cerebro-spinal meningitis occurred in 2 western counties. Meningitis occurred in 1 eastern and 1 western county. Scarlatina occurred in 1 eastern county. Diphtheria occurred in 1 eastern county. Chicken-pox occurred in 1 county.

Diseases among the domesticated animals : Pink-eye in 1 eastern and 1 middle county. Distemper in 1 western county. Hog-cholera in 1 eastern and 1 middle county. Chicken-cholera in 1 middle county.

Summary of the Causes of Death in Towns—Twelve Reporting: The ratio of deaths per 1000 per annum, as indicated in the mortuary returns from twelve towns, gives the average of 14.5, there having been 108 deaths.

OHIO.—*Monthly Sanitary Record*, the official publication of the State Board of Health, reports in abstract for May, 1888, localities, populations, and annual death-rates, as follows :

Akron, 30,000, 9.20 ; Ashtabula, 6500, 10.66 ; Bellaire, 12,000, 15.00 ; Bellevue, 3500, 6.86 ; Canton, 25,000, 10.56 ; Chagrin Falls, 1400 (?) ; Cincinnati, 325,000, 17.13 ; Cleveland, 225,000, 17.83 ; Columbus, 90,000, 11.46 ; Cuyahoga Falls, 2800, 4.28 ; Dayton, 52,000, 13.15 ; Defiance, 7000, 29.14 ; Delaware, 8000, 15.00 ; East Liverpool, 6000, 24.00 ; Fostoria, 6000 (?) ; Galion, 6500, 5.54 ; Gallipolis, 5000 (?) ; Hamilton, 20,000, 12.00 ; Hudson, 1700, 14.12 ; Huron, 1200, 10.00 ; Mansfield, 15,000, 5.60 ; Marion, 5000 (?) ; Miamisburg, 3000 (?) ;

Middletown, 7500, 6.40 ; Mount Gilead, 1800 (?) ; Plymouth, 1500, 8.00 ; Portsmouth, 14,000, 21.35 ; Ravenna, 4000, 33.00 ; Rocky Ridge, 600 (?) ; Shawnee, 4000, 9.00 ; Shelby, 2500 (?) ; Steubenville, 15,000, 8.00 ; Toledo, 80,000, 12.00 ; Urbana, 8000, 7.50 ; Wadsworth, 2500, 9.60 ; Warren, 8000, 9.00 ; Waverly, 1600 (?) ; Wellington, 2000 (?) ; Youngstown, 24,300, 17.36. Total population, 1,018,100 ; average death-rate, 14.85.

PENNSYLVANIA.—*Philadelphia* (1,016,758) reports for the week ending May 12th, 399 deaths, of which 115 were under five years of age, showing an annual death rate of 20.5 per 1000. From zymotic diseases there were 49 deaths, and from consumption, 58.

Pittsburg (210,000) reports for four weeks ending May 26th 277 deaths, of which 119 were under five years of age. Annual death-rate per 1000, 17.25. From zymotic diseases there were 23 deaths, and from consumption, 31.

TENNESSEE.—The State Board *Bulletin* reports officially the principal diseases named in the order of their greater prevalence in the State for May, 1888, were malarial fevers, dysentery, pneumonia, consumption, diarrhœa, rheumatism, tonsillitis, catarrhs, bronchitis, cholera-morbus, and cholera-infantum.

Typhoid-fever is reported in the counties of Campbell, Davidson, Decatur, Hamilton, Hawkins, Humphreys, James, Overton, Robertson, Shelby, and Wayne. Measles in Blount, Cannon, Davidson, Decatur, Franklin, Madison, Montgomery, Rutherford, Shelby, Stewart, and Wayne. Whooping-cough in Decatur, Fentress, Hardeman, Hawkins, Humphreys, and Knox. Mumps in Blount, Carroll, Franklin, Grundy, Montgomery, and Stewart. Roseola in Cannon, Decatur, Fentress, and James. Scarlet-fever in Davidson, Knox, Rutherford, and Shelby. Diphtheria in Knox, Shelby, and Williamson. Cerebro-spinal meningitis in Davidson and Hawkins. Meningitis in Campbell and Knox. Varicella in Madison. German measles in Wayne. Croup in Decatur. Small-pox in Shelby.

In the chief cities the respective annual death-rates for the month per 1000 of population are reported as follows :

Chattanooga, white,	15.50 ;	colored,	33.23 : 21.73
Clarksville,	" 2.40 ;	"	16.10 : 7.50
Columbia,	" 8.00 ;	"	12.00 : 9.60
Knoxville,	" 16.72 ;	"	26.81 : 18.79
Memphis,	" 15.81 ;	"	42.29 : 25.21
Nashville,	" 12.32 ;	"	16.46 : 13.81
Tulahoma,	" 9.23 ;	"	00.00 : 7.50

The *meteorological* features for the month show but few departures from the normal of the past six years. The principal feature was the period of low temperature about the 15th, culminating in a heavy frost in most parts of the State. The percentage of cloudiness was above the normal. The mean temperature was 65°.7, very nearly the normal for the past six years.

VIRGINIA.—*Richmond* (100,000) reports 121 deaths during May, of which 28 were under five years of age. Annual death-rate, 14.5 per 1000. From zymotic diseases there were 4 deaths, and from consumption, 18.

WISCONSIN.—*Milwaukee* (185,000) reports 299 deaths during May, of which 89 were under five years of age. Annual death-rate per 1000, 18.4. From zymotic diseases there were 35 deaths, and from consumption, 23.

YELLOW-FEVER.—Surgeon-General J. B. Hamilton, United States Marine Hospital Service, by weekly abstract of sanitary reports received through the Department of State from foreign countries, and information received through other channels, reports June 5th to July 6th, 1888, as follows :

Florida.—"Yellow-fever reappeared at Plant City, and there was one death therefrom June 22d. Another case in the vicinity, four miles and a half from Plant City, died on the 26th. There have been several mild cases in the village, which contains less than 300 inhabitants."

Stringent orders and rules from the Governor and the Board of Health of Hillsborough County for active measures for the prevention of the spread of the disease were forthwith issued and adopted. July 10th : "Only about 30 persons in the place who have not had fever. Five new cases reported to-

day. Total population, 200. Most of the unacclimated moved out. Guard around place to prevent communication." Nothing is said with regard to measures for the prevention of the spread of the disease by the baggage of 'the moved out.' "

INFECTIOUS DISEASES ABROAD.

Havana: During the months of May and June—respectively 27 and 38—deaths from yellow-fever, 65.

Guayaquil: During the two weeks ending April 29th, 10.

Cienfuegos: During the week ending May 28th, 10.

Pernambuco: During the three weeks ending May 29th, 3.

Ceara, Brazil: During the month of April, 11.

CHOLERA.—By Surgeon-General Hamilton's Abstract, as follows:

"*Tokio, Japan*.—The United States Minister, in his despatch dated May 9th, 1888, transmitted copies of a printed pamphlet, entitled 'A Brief Review of the Operations of the Home Department in Connection with the Cholera Epidemic of the Nineteenth Year of the Meiji (1886).' The following is an extract from the introduction to the pamphlet:

" 'The cholera epidemic of the nineteenth year of Meiji (1886) was the most violent and malignant since that of the twelfth year of Meiji (1879), there being 155,574 cases, among which 110,086 were fatal. Indeed, there were only 17 days in the whole year when there were no cases.

" 'The epidemic spread over the whole country, an area of 3 fu 41 ken, and even Hokkaido suffered from its invasion; but it was most violent in Osaka, Ishikawa, Toyama, Tokyo, Fukui, and Niigata. The kens of Kagoshima and Miyazaki, and the northern part of Hokkaido, were the only localities which escaped its ravages.' "

Calcutta: During the quarter ending March 31st, deaths from cholera, 541.

From more recent reports through other channels: During the five weeks ending May 26th, deaths from cholera in Calcutta, 228.

Bombay: During the five weeks ending June 5th, deaths reported from cholera, 47.

Madras: During the two weeks ending May 4th, deaths

reported from cholera, 78 ; during the two weeks ending May 18th, 19 ; report for the week ending May 11th not received.

Telegraphic : London, July 18th.—“ The most alarming reports of the ravages of cholera in the European quarters of Hong Kong have been received here both by telegraph and private letters.”

SMALL-POX.—Deaths reported from this disease (abroad at most recent dates) during the four weeks ending June 16th : Sheffield, 15 ; Bristol, 4 ; Hull, 2 ; Leeds and Manchester, each 1 ; Paris, 28 ; Lyons, 4 ; Havre, 14 ; Rheims, 4 ; Bucharest, 9 ; Trieste, 13 ; Mons, 1 ; Jumet, 1 ; Nivelles, 1 ; Gilly, 1 ; Gand, 1 ; Jemappes, 1 ; Quaregnon, 2. During the four weeks ending June 9th : Vienna, 6 ; Pesth, 2 ; Prague, 57 ; St. Petersburg, 6 ; Warsaw, 13. During the four weeks ending June 2 : Presburg, 4. During the month of May : Marseilles, 14 ; Nantes, 1 ; Rouen, 1 ; Bayonne, 1 ; Lemberg, 2 ; Lisbon, 20 ; Bombay, 90. During four weeks ending May 5th : Rome, 10. During the month of April : Nice, 2 ; Rouen, 4 ; Genoa, 5. During the month of March : Moscow, 1 ; Milan, 43 ; Bologna, 1 ; Madrid, 39 ; Saragossa, 1 ; Buenos Ayres, 85. By Surgeon-General Hamilton's Abstract : During the months of May and June : Havana, 42. During the week ending June 18th : Cienfuegos, 21. During the two weeks ending April 29th : Guayaquil, 10.

LITERARY NOTICES.

PHYSICAL DEVELOPMENT ; OR, THE LAWS GOVERNING THE HUMAN SYSTEM. By NATHAN ALLEN, M.D., LL.D., Member of the American Medical Association, the American Academy of Medicine, the American Public Health Association, the Massachusetts Medical Society, etc. 8vo, pp. 348. Boston, Mass. : Lee & Shepard. New York : Charles T. Dillingham.

The author of this work is well known to the readers of THE SANITARIAN by his contributions to its pages on sanitary subjects—chiefly relating to such topics as serve to give title to this volume, but by no means limited to them, as, indeed, the volume is not. It opens with an autobiographical sketch

which introduces the reader to the kind of student's life which is best calculated to ripen into a distinctive comprehension of natural and artificial conditions as related to mankind, and most likely to lay a substantial foundation for future study of the influences bearing upon physical development. Hence, the author is found to have been among, if not, indeed, the very foremost of promoters of physical culture in our educational institutions.

Twenty-eight years ago, through his efforts chiefly, gymnastic exercises were introduced into Amherst College as a part of the required curriculum; and while he has ever since that time, as trustee of that institution, fostered physical culture as an essential branch of study there, he has unceasingly labored for its application in educational institutions elsewhere. As an observing physician, college trustee, commissioner of charities, health officer, delegate (commissioned by Governor Washburn to the International Congress in London) to consider the matter of reform in prisons and other correctional institutions, and member of many scientific organizations, he has had extensive opportunities for observing the conditions upon which he has been one of the most prolific writers for the last quarter of a century, and from which he has drawn conclusions of practical importance to human welfare in many attitudes.

The gist of his extensive knowledge on the subject is summed up in the volume before us under twenty-eight distinctive titles and an appendix. The "True Basis of Education," "Early Education," "Physical Development," "Hereditary Influences," "Prevention of Crime," "Prevention of Insanity," "The Law of Human Increase," "Physical Degeneracy," "Vital Statistics," "The Law of Longevity," and "Birth-rate Dependent Upon Organization," are examples of the suggestive titles, which doubtless will, as they surely ought to, commend the work to many readers.

THE RELATION OF ALIMENTATION AND DISEASE. By J. H. SALISBURY, A.M., M.D., LL.D., Member of the Philosophical Society of Great Britain; Member of the American Antiquarian Society; Member of the Albany Institute; Member of the American Association for the Advancement

of Science, etc., and author of numerous contributions to medical and other scientific literature. Octavo, pp. 343, with nineteen pages of plates. Price, \$5. New York: J. H. Vail & Co.

This work endeavors to show that previous to the author's entry into the medical profession, in 1850, there was an "almost entire want of medical knowledge in regard to the causes of disease," which he at once recognized, and that pretty much everything that has been learned since of etiology, pathology, and therapeutics—particularly with regard to the cause and cure of diseases of the nervous system, rheumatism, asthma, consumption, proper alimentation in health and disease, and hog cholera—has been due to his own investigations.

We should be sorry to underestimate the value of Dr. Salisbury's investigations and contributions promotive of both preventive and curative medicine, because he has long been an acknowledged authority in the field of microscopy, and the admirable plates which illustrate the excellence of his microscopic work in the volume before us fully justify the high repute in which he is held in this respect. He cannot, on this account, however, be justly credited with all the knowledge which he claims of the relation of alimentation and disease, much of which had been demonstrated before he so suddenly jumped to the conclusion that little or nothing was known of the causation and treatment of consumption, diabetes, Bright's disease, of exclusive feeding, and the importance of a thorough diagnosis in the treatment of all diseases. Much that he says, however, with regard to the importance of alimentation and regimen, generally, as the most important means of preventing and curing disease, especially of consumption, is in the highest degree commendable; and while we are not prepared to accept his "plan of treating disease" exclusively by food and regimen and "nothing else," we are of the opinion that the influences of heredity and climate is greatly overrated and too much relied upon, and that Dr. Salisbury's views on this subject, though extreme, are a safer guide than the common practice.

His estimate of the value of abstinence from starch and sugar as a means of preventing fibrous growths; his ability, as he professes, to diagnose rheumatism by the appearance of

the blood, months before the patient has any idea that he is rheumatic ; and his theory of the production of thrombosis and embolism by the excessive use of sour foods are novel propositions, which we opine the profession is not yet prepared to accept. These questions will doubtless receive, as they deserve, the assiduous attention of other observers in the same field of inquiry.

His tabulated results of experiments on feeding exclusively with "baked beans," "oatmeal," and "Army biscuit," and his description of the results of exclusive feeding with other foods, both vegetable and animal, are interesting and instructive ; suggestive of the novel conclusions just above referred to, and well calculated to stimulate continued and increased inquiry in the same direction.

On the whole, while the work is presumptuous and radical to a degree not calculated to allure the attention of medical practitioners wedded to old paths, they of all others may read it with most profit. For however doubtful some of its propositions, it contains a good deal that is new, and with such evidence as physicians who would be abreast with the work of the laboratory as well as clinical medicine cannot afford to reject without examination.

The publisher's part of the work—paper, type, plates, in particular, and binding—is excellent in all respects.

ATLAS OF VENEREAL AND SKIN DISEASES. By PRINCE A. MORROW, A.M., M.D., Clinical Professor of Venereal Diseases ; formerly Clinical Lecturer on Dermatology in the University of the City of New York ; Surgeon to Charity Hospital, etc. Imperial folio atlas, to consist of fifteen parts containing seventy-five chromo-lithographic plates, containing several hundred figures, many of them of life size, in flesh tints and colors, together with descriptive text for each plate, and from sixteen to twenty folio pages of a practical treatise upon venereal and skin diseases ; the whole to form one volume. In the composition of the work, besides Professor Morrow, many of the most distinguished authorities on the subjects treated of have been secured as contributors : among them Kaposi and Neumann, of Vienna ; Hutchinson, Fournier, and Hardy, of London ; Ricord, Cullerier, Besnier, and

Vidal, of Paris ; Leloir, of Lille ; Keyes, Fessenden, and Piffard, of New York ; Hyde, of Chicago, and others.

Fasciculus VIII. of this excellent work, now before us, contains five plates of life-like representations of skin diseases with which every physician should be familiar. Plate XXXVI.—Sebarrhœa, Comedo, Miliun, and Sudamina ; XXXVII.—Typhus-fever and Typhoid-fever ; XXXVIII.—Variola and Varicella ; XXXIX.—Rubeola and Rubella ; XL.—Scarlatina and Erysipelas. All, like those which have preceded, wonderfully true to nature, and with descriptive context of remarkable completeness in detail, pertaining to the nature, diagnosis, classification, course, clinical features, and treatment of the diseases represented.

THE INFECTIOUS DISEASES. By KARL LIEBERMASTER, Professor of Clinical Medicine in Tübingen, Germany. Translated by E. P. Hurd, M.D. 2 vols., pp. 269. "The Physicians' Leisure Library" (Numbers 8 and 9). Subscription price, \$2.50 a year—issued monthly ; single copies, 25 cents. Detroit, Mich. : George S. Davis.

This is a standard work on a subject requiring the greatest possible familiarity on the part of every medical practitioner, divested of all redundant matter ; and we know of no book on the subject which contains so much that is really essential in so little space.

THE MEDICAL REGISTER OF NEW YORK, NEW JERSEY, AND CONNECTICUT, FOR THE YEAR COMMENCING JUNE 1st, 1888. 12mo, pp. 457. Published under the supervision of the New York Medico-Historical Society. William T. White, M.D., Editor. New York : G. P. Putnam's Sons.

This work is in its usual compact form, uniform with previous editions. It contains the names and addresses of 6976 physicians, about 300 dentists, 1000 pharmacists, 110 veterinarians, 150 nurses, numerous societies, organizations, institutions, libraries, records, tables, business directory, recent laws of interest to physicians, obituary, medical history, meteorology, streets and ferries of New York and Brooklyn, and much other matter of practical utility to all concerned. That there should be errors in a work of so much detail, yet requiring

the utmost degree of condensation consistent with its extensive scope, is hardly to be avoided ; but there are some in this—of repetitions from the preceding edition and additions, due doubtless, for the most part, to the neglect of those most concerned to notify the editor, but a few otherwise—which ought to grow beautifully less year by year in succeeding issues. Taken altogether, however, as compared with similar publications elsewhere, it is a work of remarkable excellence, alike creditable to editor and publishers, and eminently useful.

TRANSACTIONS OF THE MEDICAL SOCIETY OF PENNSYLVANIA, Vol. XIX., 1887. Dr. W. B. Atkinson, Philadelphia, Permanent Secretary. pp. 283. The only papers on preventive medicine in this volume are, "Report on Hydrophobia : Pasteur's Method," by Charles W. Dulles, M.D., Surgeon to Out-Patients in the Hospital of the University of Pennsylvania and in the Presbyterian Hospital, Philadelphia ; and "Address in Hygiene," by J. D. Thomas, M.D., Philadelphia. Dr. Dulles gives an account of the development made in the progress of Pasteur's treatment during the preceding year, and "the two principal fallacies" upon which Pasteur's claims rest. First, "that hydrophobia is a specific, inoculable disease," and second, that "Pasteur's method has actually saved a large number of persons, who but for it would have died of hydrophobia." These propositions are energetically urged by the citations of arguments with which most sanitarians are familiar, as they are also with an opposing amount of evidence accepted by the painstaking British Commission.

Dr. Thomas's address is confined to the importance of cleanliness, and with special regard to its neglect in filth storage, bad plumbing, impure water and ice.

There are nineteen addresses, papers, and reports on disease in its curative aspect, all of some interest to medical practitioners, but, including the two reports on preventive medicine, the contents of the volume as a whole compares unfavorably with preceding reports of the same society.

TRANSACTIONS OF THE INDIANA STATE DENTAL ASSOCIATION, 1887. Mrs. W. M. HERRIOTT, Indianapolis, Ind. Pamphlet of eighty-six pages, containing several reports and papers, and discussions of importance in practical dentistry ;

and one, measurably, on *preventive* dentistry—"Management of Children's Teeth," by J. E. Cravens, D.D.S.—which is eminently worthy of extended circulation; and we are glad to know that it was, also, so appreciated by Dr. Patterson, editor of the *Western Dental Journal*, who obtained the privilege of publishing it in his journal.

TRANSACTIONS OF THE AMERICAN DERMATOLOGICAL ASSOCIATION AT THE ELEVENTH ANNUAL MEETING, IN BALTIMORE, 1887. G. H. Tilden, M.D., Secretary, Boston, Mass. A pamphlet of forty-nine pages, full of practical information of interest to all physicians.

NEWSPAPERS IN 1888. From the edition of George P. Rowell & Co.'s "American Newspaper Directory," published April 2d (its twentieth year), it appears that the newspapers and periodicals of all kinds issued in the United States and Canada now number 16,310, showing a gain of 890 during the last twelve months and of 7136 in ten years.

The publishers of the Directory assert that the impression that when the proprietor of a newspaper undertakes to state what has been his exact circulation, he does not generally tell the truth is an erroneous one; and they conspicuously offer a reward of \$100 for every instance in their book for this year, where it can be shown that the detailed report received from a publisher was untrue.

MEDICAL EXCERPT.

FOR SLEEPLESSNESS. —The most recent remedy brought forward for sleeplessness is *Sulfonyl*. This substance is the product of oxidation of a compound, resulting from the action of acetone or æthylmercaptan. It occurs in the form of large, flat, colorless crystals, which are tasteless and devoid of smell. It is soluble in eighteen to twenty parts of boiling water or one to one hundred parts of tepid water, but more readily in alcohol and alcohol mixed with ether. Its composition is not affected by acids or alkalies.

Dose, to begin with, fifteen grains; commonly takes effect in from half an hour to two hours, and is sufficient to insure several hours of refreshing sleep. But if insufficient, the dose

may be increased to sixty grains. The best time to administer it is in the late afternoon or early evening hours. It is said to be absolutely free from the disagreeable after-effects common to other hypnotics.—*Edmund Charles Went, M.D., Medical Record, June 2d, 1888.*

NITRO-GLYCERINE IN HEADACHE.—Dr. John Aulde, of Philadelphia, cites the case of a gentleman over sixty years of age who consulted him some years ago for a headache which had persisted for several weeks despite other treatment, for whom he ordered one drop of the one per cent solution of nitro-glycerine in water, every five minutes, until six doses had been taken, just before retiring. The result was that he felt all right the next morning, although later in the day the same symptoms showed a disposition to return. Accordingly, the medicine was repeated the following evening with perfect and permanent relief.—*Medical and Surgical Reporter, June 30th, 1888.*

THE TREATMENT OF PNEUMONIA, according to a contribution to a recent number of the *Medical News* by Dr. Henry Hartshorn, of Philadelphia, was considerably more successful, under the use of the lancet and tarter emetic, forty years ago, than it is or has been since the very general abandonment of those remedies. By an analysis of many thousand cases treated in the hospitals and armies of Great Britain and the United States, and the tabulated statistics of medical authors, he shows that before the anti-blood-letting movement set in the mortality was scarcely half as great as it is at the present time. Examining the records of the Pennsylvania Hospital, as a representative institution, with a medical staff excelled by none in reputation and ability, he reports the results as follows : In the three years, 1845, 1846, and 1847, 1 death in 16 cases— $6\frac{1}{4}$ per cent ; in 1865, 1866, and 1867, 1 in $5\frac{4}{10}$, or 18.5 per cent ; in 1884, 1885, and 1886, 1 in 5.2, or more than 31 per cent.

Of 11,627 deaths from pneumonia in Great Britain, Ireland, and the Continent of Europe, within a few years prior to 1858, whose cases had been treated by between forty and fifty physicians, 2751 were treated with bleeding and 8876 without it. Among the latter, however, 452 had exceptional modes of medication in the use of chloroform, lead, copper, or iron. Deducting these, the comparison rests between 2751 cases

treated with and 8424 without bleeding. Of the former there was 1 death in 11 cases; of the latter under all treatments except with opium—except also that of the 452—1 death in 9.7.

Large and repeated bleedings, 1 death in 11.6; bleeding a few times, or moderately, 1 death in 12.3; bleeding and tartar emetic, 1 in 12.3; tartar emetic, no bleeding, no opium, 1 in 11.3; opium, without bleeding, 1 in 3.3; tartar emetic and opium, without bleeding, 1 in 3.8 cases.

In United States Army, between 1840 and 1854, there were 1416 cases, with 127 deaths—1 in 11.15; between 1855 and 1859, 657 cases, with 97 deaths—1 in 6.67: an increase of over one third in the proportion. Skoda estimated the average mortality of pneumonia, about 1841, as 1 death in 8 cases. Balfour, near the same time, reported his observation in a homœopathic hospital under Fleischmann (treatment probably *nil*), of a mortality of 1 death in $6\frac{1}{2}$ cases; Dietl, with diet only, no bleeding nor medication, 1 death in 3.5 cases; in the British army, at home, and in various stations, average of all together, 1 death in 20.66 cases; hospitals in a number of different cities in Europe, from 1822 to 1854, average 1 in 9.54; United States Army, as already said, from 1840 to 1850, 1 in 11.15; Pennsylvania Hospital, as before mentioned, 1845, 1846, 1847, 1 in 16. Taking all these together, it is safe and fair to estimate the average mortality of pneumonia, during the second quarter of this century, as not more than 1 death in 12 cases, or 8.33 per cent, as against the at present prevailing mortality of from 18 to 25 per cent.

A NEW DISINFECTANT—CRUDE SULPHO-CARBOLIC ACID.—E. Laplace (*Pharm. Zeitung*) recommends crude sulpho-carbolic acid as a reliable bactericide and as a general disinfectant, inferior only to solutions of bichloride of mercury of the same strength, but having the advantage of being much less poisonous and considerably cheaper. It is obtained by mixing equal parts of crude sulphuric acid and crude twenty-five per cent carbolic acid, heating for a short time, and allowing to cool. This mixture is easily soluble in water. A four-per-cent solution killed anthrax bacilli within forty-eight hours, which a two-per-cent solution of pure carbolic acid was not able to do.—*Druggists' Circular*, May, 1888.

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DIETETICS AND INFANT FEEDING.

ABSTRACT OF THE ADDRESS OF E. A. WOOD, M.D., CHAIRMAN OF THE SECTION, AND OF THE REPORT OF THE SPECIAL COMMITTEE ON DIETETICS AND DISEASES OF CHILDREN; TOGETHER WITH AN ABSTRACT OF OTHER PAPERS ON THE SAME SUBJECT IN OTHER SECTIONS, AT THE MEETING OF THE AMERICAN MEDICAL ASSOCIATION, CINCINNATI, O., MAY 8TH-11TH, 1888.*

DR. WOOD'S ADDRESS.

. . . PERHAPS in no other class of maladies is the reliance on alimentation so apparently remedial as in the malnutrition and diseases of infancy and childhood. The mortality of children under one year of age is frightful and criminal; frightful from the large proportion of deaths, and criminal because nine tenths are from preventable causes. It is believed that a large majority of the cases of sickness among children, especially during the summer months in cities, are caused by overheat, bad ventilation, improper food and faulty feeding, and the prevalent opinion is probably correct. But in the multiplicity of causes precision is impossible. All these causes play parts in the terrible drama, but too little is known of the exact influence of each cause separately considered. Of them all it is almost certain that improper food and overfeeding, especially in cities during the hot weather, are the two which preponderate.

There are two classes of people that need looking after: the first is the vendor of unwholesome milk. This class must be

* From the reports of the *Journal of the Association* and *Philadelphia Medical Times*.

taken in charge by the strong arm of the law. Milk kept in foul vessels, watered milk, adulterated milk, and milk from wretched cows chained up all their miserable lives in dark stables and fed on brewery slops, slay annually thousands and thousands of helpless babes in our cities. Such milk is unfit for any purpose, and it should be kept out of the market. Those who vend such milk are deliberate murderers, and they should meet with the punishment commensurate with their cowardly crime. The other class consists of the mothers and nurses, who will persist in overfeeding babes, dreading starvation, ignoring the fact that babes need water, not milk, when fretful and feverish from indigestion. The crime of this class is ignorance, and they must be educated out of their pernicious practice. Thousands of children may be saved by lessening the amount of food during the heated term.

The questions, What is the best substitute for human milk, and what is the best food for weakly and invalid children? although more frequently asked than formerly, still remain *sub judice*, or at least the solution of the questions is not generally accepted in practice. Accurate knowledge in regard to them must be given by some authoritative body.

Cows' milk, sometimes slightly modified, seems to be the most rational and favored as the substitute for the mother's milk. This generally accepted belief is based partly on experience, and partly on the physiological precept that there can be no digestion of starch foods prior to dentition. But experience and precept are sometimes both upset in cases of infants who do not digest milk, but who do digest modified starch foods. In the absence of precise knowledge on the subject of infant foods and feeding, we go on treating infantile maladies with an empiricism redeemed only by the common sense and experience of the individual practitioner. The aggregated and formulated experience of the whole profession is wanting, while tradition, united with straggling experience, serves as a fickle indicator rather than a reliable guide in the dietetics of infancy and childhood.

Among the besetting evils of Americans are rush, overwork, great plenty and variety of food, great food waste, bad cooking and badly cooked food, hurried eating, foul water supply to cities, and dram-drinking. Any one of these evils tends to

the impairment of health, and all of them aggregated are sure to result in the deterioration of the race. The duties of the medical profession have so widened that it is become, to a large extent, the custodian of public health. The world cannot produce such a field of useful, necessary work as lies before the profession in America—the work of arresting the decay of the American race. Can this Association, whose grand function it is to crystallize medical thought and direct medical art in this country, longer refuse to lend its authority to warn our people of the danger ahead, and to direct its powerful organization against the evils which, if not arrested, will result in disaster to our people and our nation?

Dieticians will incline to ultraism, but the principles of dietetics cover too much ground to ever assume specialty, or build up an esoteric class of practitioners. Dietetics is too broad for the specialist. Ultraism is not always an evil nor its practice a sin. All great medical pioneers have been regarded as extremists in their day. The ultraism of a generation ago is the conservatism of to-day.

And what is the ultraism of dietetics? Briefly, that digestion and nutrition constitute the all in all of animal life; that many forms of disease, as gout, rheumatism, Bright's disease, many neuroses, skin diseases, and other affections, are but manifestations of faulty digestion or malnutrition; that maladies belonging to the above class can only be successfully treated by judicious alimentation, while drugs hold a very subordinate place in their cure. This kind of ultraism will grow and deserves to grow.

There is one abuse which has crept into modern practice under the seeming sanction of dietetics, and which calls for loud protest. Allusion is had to what may be termed *vicarious digestion*. This term applies to all methods by which the digestive organs are relieved of all or a part of their work, and includes the employment of all bland and easily digested foods, malted foods, predigested foods, and food per rectum. This practice, so efficient and necessary in acute stages of disease, and in all conditions where there is suspension of digestion, is pernicious when, as it often is, too long continued, or employed in cases where the digestive act is even moderately well performed. The pabulum supplied by vicarious digestion is not,

it cannot be, endowed with that robust vitality belonging to the product of normal digestion, and hence can supply only a low grade of nutrition, sufficient, it is true, to bridge the system over a short interval of interrupted digestion, but lacking the vigor to sustain a strong and active state of health. Again, if vicarious digestion is too long continued, or employed unnecessarily, paupers are made of the digestive organs. Our teeth are going because there is no longer need of that vigorous mastication peculiar to an age of crude cookery, and, if we persist in carrying vicarious digestion to the extent threatened, the stomach will lose its function and waste away toward the state of a rudimentary organ. The only way to keep the stomach strong is to force it to perform its legitimate work.

Vicarious digestion may become a habit if indulged in for too long a time ; the papoid habit may become as enslaving and as destructive as the opium habit. The tissues will starve on cells that enter over the wall instead of by the appointed portals of vital action. Such nutrition does not stay, the puny cells have not received the stamp of genuineness and every emunctory is up in arms to turn the rascals out.

THE INFANT FOOD PROBLEM.

By William B. Atkinson, M.D., Professor of Sanitary Science and Pediatrics, Medico-Chirurgical College of Philadelphia, Member of the Committee on Dietetics, etc.

To the general practitioner everywhere, there comes constantly the question, What means shall be employed to prevent the terrible mortality among infants deprived of their natural food, the mother's breast-milk. As it is in very many instances impossible to place the child outside the walls of a large city, this want of proper hygienic surroundings acts as one great factor in the production of disease. But perhaps the most active cause of disease is the exhaustion of the vital powers from the want of those articles, which being properly and readily assimilated, aid to maintain the body in its highest and healthiest condition. We all know that, other things being equal, that child which has been able to keep its system in the best state, its blood rich and pure, its muscles plump

and firm, is sure to pass through an epidemic of children's affections either entirely unscathed or suffering only from a slight attack, readily throwing off the disease and never being troubled with the sequelæ.

Defective nutrition, then, is the predominant factor in the causation of the fearful mortality everywhere observed among children. We need only point to the statistics of children's hospitals, foundling asylums, and similar institutions to show the truth of this proposition.

To us, as physicians and sanitarians, as citizens earnest for the welfare of this great republic, this comes with powerful import. An additional fact also appeals to us, when we learn that the vast majority of these are native-born offspring, while those who survive are largely the children of foreigners. This is shown by the valuable statistics of such investigators as W. Nathan Allen. Though we are compelled to admit that other causes, and one a very potent factor, produce the great disproportion between offspring of natives and foreigners, yet it must be admitted that the truth of our original proposition is still evident, that defective vitality causes a vast majority of deaths among infants, and even in children of larger growth.

The latter fact is constantly shown by the great mortality which prevails, when by reason of short crops or other causes, the people are unable to procure the food needed to maintain their systems at par, and thus resist the inroads of disease.

It goes without saying that the infant should be raised on its mother's milk whenever possible. When, for any cause, this fails, then comes the question, What shall be the substitute? Abroad, the milk of asses and goats is in quite common use. Cows' milk being that most easily obtained, is most largely employed in this country. This being the fact, we next come to the consideration as to how the two kinds of milk differ and what is needed in order to cause that of the cow most nearly to approach that of the human being?

Cows' milk contains more proteid matter, more fat, more mineral matter and less sugar, and as a rule in health, human milk is alkaline, while cows' milk is often slightly acid. One special difficulty with cows' milk is that its acidity is more or less likely to form an insoluble mass by contact with the gastric juice, while the casein of human milk is in part a peptone

and forms a very delicate coagulum when in contact with the gastric juice.

The object is always to produce a food for infants closely resembling in its composition mothers' milk, and the nearer this is reached in all its details, the more surely will such food prove wholesome and valuable to the infant.

Our idea of a standard infant food, when produced, would be as follows: Be sure to obtain the milk of a healthy cow. Just here we may premise that we do not believe in the common fallacy "one cow's milk." The mixture of the milk of several healthy cows is more likely to give an article of real value. Undoubtedly, many in this audience can substantiate the claim that it is most usually the pet cow, from which the milk is obtained which is put by for the sick baby, that receives all the banging, hurrying, and pelting, and as we all know, is thus likely to yield a milk which may actually be poisonous in its nature. The best combination would be pure milk diluted with sufficient pure water to reduce the relative proportion of albuminoids and mineral constituents most nearly to that of human milk, then partially peptonize or digest it, and finally, add a soluble carbo-hydrate with sufficient alkali to produce as close a resemblance to breast-milk as may be. We must not forget that peptonizing milk does not relieve us of the need of being sure that the milk is at the outset pure and fresh.

The milk supply of large cities has now become one of the great problems of the day. Churned in the cars to the city, then more thoroughly churned in the wagons over wretchedly paved streets, distributed in many cases from doubtful cans by persons of much more doubtful appearance as to their own cleanliness, the flavor often aided by the puffing of a cigar or filthy pipe on the part of the distributor, the article is received in many cases in a receptacle of equal doubt as to cleanliness, it is placed, perhaps, in a food chest, or so-called refrigerator, exposed to the atmospheric contact of other articles of food; is it to be wondered that the milk becomes of a very doubtful form as to its propriety as an infant aliment?

To a certain extent, these objections are met by the new plan of delivering what is called "whole milk." The milk, immediately after being drawn from the cow, is very carefully

placed in glass jars. These being quite full are hermetically sealed so that there can be no opportunity of churning or adulteration or the absorption of odors or disease germs.

For children who have passed the age of infancy, I have long been in the habit of urging the employment, particularly during hot weather, of what is called "evaporated milk."

Its claims were that it was milk from healthy cows, well-fed, and being of a density greater than cream, churning or souring were less likely to occur during its transition to the city. Again, it was very much less ready to absorb or appropriate the odors, etc., to which it might be subjected. I have found this more easily borne by the child, and repeatedly I have been compelled to substitute it for the "condensed milk," where a certain proportion of sugar is added in order to preserve the article.

For these reasons, Professor Vaughan urges the use of dried milk solids, that is, they can be transported without injury from any distance, and if properly prepared may be kept without putrefaction occurring. Now, if such pure milk from perfectly healthy cows was partially predigested by the process of peptonization with fresh pancreatine, the temperature then sufficiently raised to destroy the remaining ferment, reduced to a powder by evaporation, and to this, dextrine added, thus supplying the carbo-hydrate, we would then be as near the production of a proper food for infants as might be possible in the absence of the breast-milk.

By recent researches, we have been taught that dextrine is the best form of carbo-hydrate, as it is non-fermentable and does not irritate the stomach of the infant, is easily assimilated, and, unlike cane sugar or maltose, is not likely to take on acid fermentation. Roasted wheat flour has long been employed and recommended as an article of food for infants, and particularly where diarrhœa is present. The reason of this is because this process converts the starch of the flour into dextrine.

The malt sugar or "Liebig Foods" are, no doubt, often valuable, particularly in infantile constipation, for their laxative effects; but are extremely liable to continue a diarrhœa or increase it. When these are used for their laxative effect, it is safer to use them alone rather than with milk, lest their fer-

mentative tendency be aggravated by the presence of too great a quantity of albuminoid matter.

I am incited to this remark by the remembrance that the Liebig Foods do not by themselves meet the requirements demanded for infantile nutrition, unless with the addition of cows' milk. By an examination of the analyses of such mixtures, we find that they add no essential to cows' milk; nor do these foods act chemically upon the casein, nor physically, by reason of their solubility; and, as I have before remarked, they may give rise to disorders of digestion, in consequence of the readiness with which they take on fermentation.

Farinaceous foods are, of course, out of the question, because of the absence of ptyalin in the secretion of the salivary glands in the earlier years of infancy. The addition of starchy matters to cows' milk, for the purpose of rendering the coagulum less dense and more easily broken up by the stomach, as has been recommended by some authorities, is wrong in principle; it really adds an indigestible element, which cannot fail to act as a foreign body, sure to produce fermentative acidity, diarrhoea and the usual train of evils.

The milk foods when diluted with water in accordance with directions, should correspond in nutritive value with human milk. Now that this correspondence should be more nearly perfect, they should also be partially predigested or peptonized, in order that the casein may be rendered more acceptable. It is also necessary that sugar in some form should be added.

In peptonizing milk, it is of the greatest importance that the pancreatic extract which is employed should be pure and fresh. The odor of some digestive ferments as furnished by the stores, is such as to give rise to the suspicion that they are already assuming the putrefactive tendency. In fact, it is a very difficult matter to preserve them, as it is well known that the products of the pancreas are much more readily decomposed than any known animal substance. Hence the greatest care will be necessary so there shall not be the slightest possibility of the presence of putrefactive germs in any of these articles that may be employed to aid in the preparation of the diet of infants. The peptonizing of milk, although, apparently, a very simple matter as practised in the laboratory, yet is scarcely feasible in the household.

Another point is of great importance. Malt sugar is eminently prone to absorb moisture and hence it should not be combined with dried milk, and then put in bottles or other form of package for family use, because, as these packages are only partially used at one time, the balance is extremely liable to absorb moisture, resulting in fermentation ; and this is more especially the case in hot weather or when kept in a hot room.

We cannot too strongly urge upon all who are compelled to prepare food for infants, the great, the imperative necessity of using only water that has been boiled. To the medical man, the reason is plain, yet it would not be amiss for him to explain in each instance why this should be done. Just here it is equally important to see that the water is not cooled by the addition of ice, as we may thus return at once to the water the very organisms which the boiling was intended to expel. I am impelled to this remark by the remembrance of an inspection just made for the State Board of Health of Pennsylvania. The subject of complaint was the ponds from which the ice was obtained to supply the demands of a large town. These ponds were filled with water from a stream, really nothing but a drain for a full graveyard, one or more slaughter-houses, a large number of cess-pools which were in constant use, and a large area of swamp land.

In diluting any form of infant food, we should give positive definite quantities. Undoubtedly all of us have encountered many cases where the child was really starving, while apparently receiving a large quantity of fluid. The fact is that the dilution had been carried too far.

It is unnecessary for me to occupy your time with further points as to times for feeding or of necessity for using bottles, etc., etc.

Before closing, I may remark that in my investigation of foods for the preparation of a paper which may be read elsewhere, I received from my friend, Chief Medical Purveyor Baxter, of the United States Army, a tabulated analysis of some fifteen forms of foods. Of these, only four contained more than ten per cent of nutritive material, thus showing that even here we are likely to be deceived, and to be employing an article as useless for its proposed purpose as the too largely diluted food of the infant already mentioned.

In conclusion, permit me to say that it has long been my custom not only in my practice, but also in my teachings, to urge the giving of less medicine, using it only when imperatively demanded, and to insist upon the value of proper hygiene and proper nourishment, believing that these alone in many cases will at once place the child on the road to health, and, if persevered in, will, as a rule, maintain it there.

DISCUSSION.

The discussion was led by Dr. W. S. Christopher, of Cincinnati. He found condensed milk a valuable food for children. With cream mixtures his experience has not been satisfactory. He used at the Home for Foundlings, cows' milk diluted with lime water for children who were comparatively healthy. Several years ago he tried peptonizing milk, but it was a total failure, and he was obliged to stop it in order to save the life of the child. He did stop it and the child lived. In consequence of this, peptonized milk grew in great disfavor with him. There can be no doubt whatever but that pancreatic extracts are likely to undergo putrefaction, that they are things extremely proper for putrefaction, and it is consequently a fact, on the face of this, that they are improper food for infants. He stated that he could not agree with Dr. Atkinson in his statement that dextrine could not ferment.

Dr. Christopher expressed his opinion that to properly nourish a child at different times and under different conditions, it would be proper to study the condition of the stools and its general condition, and then adopt a food whose composition was indicated as proper nourishment at such times. For instance, if we have a stool of a putrid character, we must refrain from albuminoid substances, and when we find the stool sour, we may be sure that acid fermentation is the cause. He said dextrine was preferable to starch as an addition to milk, because it is in the intermediate state between starch and glucose.

REPORT OF THE SPECIAL COMMITTEE ON INFANT FEEDING.

Americans are beginning to recognize the value of dietetics, and the question of what to cook, and what to eat and drink, that which will secure the highest degree of comfort and ex-

tend life, is being asked more and more. This has turned dietetics into a practical knowledge. It stands in the front rank of the medical art. Dietetics has joined hands with organic chemistry, to elevate the popular tastes, and promote a deeper scientific research that will in the end find that which will maintain the human life, appease hunger, and promote health from the cradle to the grave. Dietetics has joined hands with physiology, and clearly illustrated the various properties of vegetable and animal tissues. We know that food which is suitable for digestion prevents disease, and being well prepared, is made inviting to the taste and suitable to nutrition. Dietetics has taken the physician into its hands, and has led him into new and fresh fields. It is found to be easier and far more profitable to lead the patient back into the path of health by a judicious nourishment and dieting, than by giving him horrid doses of powerful medicines, etc., etc. Perhaps in no other class of maladies is the fitness of the alimentation so supreme in importance as in infancy. The mode of feeding children and treating them under one year of age is in many cases almost criminal, when we consider the large percentage of deaths.

It is believed that a large majority of cases of sickness of children, especially during the summer months in cities, is caused by overheat, but the effects of hot weather and crowded cities, though bad, are over-rated. There are two causes of this trouble ; first, the vendor of adulterated milk—milk that has been kept in vile vessels—watered milk—adulterated milk—milk that has been obtained from diseased cows, who have been confined in hot filthy stables throughout all their miserable lives—such milk as this slays thousands of helpless babes in this land of ours each year. Such milk as this is unfit for any purpose, and it should be kept out of America. Those who vend such milk are deliberate criminals. The other class of infants' diseases is caused by mothers and nurses who will persist in over feeding babies, dreading starvation, and forgetful of the fact that when a baby cries it wants water, not milk.

As to the difficulty of obtaining milk, thousands of children might be saved, by reasoning out what is the best substitute, and what is the best substitute for the individual case. Cows'

milk would seem to be the most rational substitute ; but there are many cases where the infant cannot digest the milk, where it can digest some starch foods. In the absence of knowledge, we go on treating the infantile martyrs, regulated in our course of treatment only by whatever common sense we have, and the personal experience of the individual practitioner.

Through the knowledge of dietetics the members of the medical profession have become the custodians of the public life of the people of America. It is our duty to attend to the health and future welfare of the American race. It is the duty of this Association, of this Medical Convention, to warn our people of the danger threatened, and to direct its powerful organization against the evils, which, if not arrested, will result in disaster to the people and nation.

The committee would also call the especial attention of the Association to the various so-called artificial foods that are being manufactured, and that fill our drug-stores throughout the country and are sold as fit food for infants and invalids. Many of these compounds are highly injurious, and yet they are being sold in large quantities. On this subject the American Medical Association must exercise its authority in the most positive manner. What is wanted is a thorough investigation of these various compounds by a committee of competent men who will command the confidence of the country.

Your Sub-Committee on Infant Feeding respectfully reports that it has only had the subject under consideration for about two months, and during this time it has opened correspondence with some of the leading authorities, both in this country and in Europe, upon the very important questions submitted to it, especially with reference to the proper diet of infants. Though not prepared to make a final report upon the subject at present, it believes that some facts have been elicited which are valuable and which are of sufficient interest to bring before this Association.

Thus far, replies have been received from Dr. Eustace Smith, of London ; Dr. J. Lewis Smith, of New York ; Dr. Victor C. Vaughan, of Ann Arbor, Mich. ; Dr. George H. Rohé, of Baltimore ; Dr. F. Forchheimer, of Cincinnati, and others, to whom we desire to return thanks for their assistance and courtesies. (The correspondence and replies to queries submitted are appended to this report.)

The leading facts thus far obtained may be briefly stated as follows :

1. In the case of an infant, or a child under ten months of age, deprived of breast-milk, the artificial substitute provided should be made to correspond with human milk as closely as possible, both in its chemical constitution and in its physical characters.

2. Fresh, unadulterated cows' milk, when properly prepared, is an acceptable substitute for breast-milk. But since the casein of cows' milk coagulates in a heavy, dense mass, while breast-milk curd is light and flocculent, some expedient must be resorted to in order to make the former resemble the latter, so that the digestive powers of the infant shall not be unduly taxed. The casein of cows' milk, according to Dr. Eustace Smith, as the rule, traverses the infant's alimentary tract and may be found unchanged in the fecal discharges. It is therefore a constant source of irritation, and often gives rise to diarrhoea and entero-colitis. One of the most decided advances in dietetics in modern times, is the preparation of cows' milk with the aid of digestive agents, as in the method recommended by Professor Frankland. In this method the casein of a portion of the milk is first peptonized by fresh calves' rennet, and to this is added a portion of fresh milk, after heat has been applied to check the process and to prevent complete predigestion ; some milk-sugar is finally added, and thus a mixture is obtained which closely approximates human milk in its chemical composition. It has, moreover, been found to serve as an efficient substitute, where the mother's milk is of poor quality, is inadequate in quantity, or is entirely wanting. The special feature of this method is the peptonizing of only a part of the casein, with the employment of heat at a certain stage to arrest the process so that the food shall not be completely digested. The addition of the carbo-hydrate (milk-sugar in this case) is necessary, in order that the food shall closely resemble human milk. The employment of stale, foul-smelling, partially decomposed digestive ferments, for the purpose of preparing cows' milk for infants' food is condemned. The necessary skill and intelligence required to insure uniformity of result for the extemporaneous peptonizing of milk is rarely to be found in the household, and where this process is

adopted, the experiment often turns out to be unfortunate and injurious to the child.

3. As a rule, raw starch is inadmissible in the diet of young infants, because the digestive powers of the infant are rarely sufficiently active to convert crude starch into a soluble form. The plan advocated by some, of adding the starch to the milk in order to mechanically break up the curd, is unphysiological and very objectionable. The products of the complete digestion of starch are glucose and saccharose (maltose), and these, in various forms, have been recommended to be used as additions to the milk, under the name of "Liebig Foods." When in excess, these substances cause diarrhœa, and when given alone do not sufficiently nourish the child. Dr. J. Lewis Smith speaks favorably of dextrine, which is a partially digested starch, as a good substitute for glucose and saccharose in such artificial foods. The fact cannot be too strongly insisted upon, which is taught both by clinical experience and by physiological investigation, that the food of either infants or adults, except in special emergencies, should never be fully predigested, for fear of permanently weakening or destroying the digestive functions of the stomach.

4. A great part of the large mortality of infants in all our cities is due to the bad quality of the milk supply, particularly that going to the poorer classes. Professor Vaughan declares that many deaths from so-called cholera-infantum are really caused by milk containing tyrotoxon. Authorities are almost unanimous upon the point that in large cities, at least during hot weather, all milk for the nursing bottle should be boiled several times a day, in order to destroy ferment-germs. It is better, at such time, that the food should be freshly prepared for each feeding. In some cases, owing to the variability in the quality of the milk supply, it may be advisable to resort, for a short time, to condensed or evaporated milk; in either case diluting and adding cream, or an equivalent, soluble carbo-hydrate, in order to make an artificial breast-milk. Desiccated partly peptonized milk, in the form of a milk food, containing partly converted starch (soluble starch and dextrine), and a small quantity of lactose is a convenient (and when well made, a very efficient) substitute for the mother's milk.

5. Where a child is a premature birth, or is feeble from

other causes, as great care should be observed in preparing its food as in prescribing its medicine. Experience has demonstrated that success in infant-feeding is dependent upon the ability to individualize the patient, and to select the proper food for each case. For very delicate infants the mother's milk is often found not only inadequate to properly nourish the child, but also positively injurious. This is generally admitted where some obvious dyscrasia exists, as the tuberculous or syphilitic. It is a fact that in such feeble infants artificial mixtures can be made which will agree with the weak digestive functions and satisfactorily nourish the child.

In conclusion, your sub-committee would direct attention to the remote and far-reaching effects of the malnutrition resulting from improper feeding in early life, to be witnessed in chronic invalidism or in premature death of the individual, and to the inevitable physical degeneracy threatening the race where the principles of infant dietetics are neglected. In view of the importance of the subject, the sub-committee respectfully ask to be continued in order to further investigate the matter, and to report to the next meeting. All of which is respectfully submitted.

FRANK WOODBURY,

Chairman of Sub-Committee on Infant Feeding.

A SYMPOSIUM ON INFANT FEEDING.

By Drs. Eustace Smith, of London ; J. Lewis Smith, of New York ; F. Forchheimer, of Cincinnati ; George H. Rohé, of Baltimore ; Victor C. Vaughan, of Ann Arbor, Mich., and Frank Woodbury, of Philadelphia.

[In the effort to establish some fixed principles with regard to infant feeding, particularly from the clinical standpoint, questions were formulated and sent to various gentlemen of experience in the treatment of children's diseases ; and the following replies were kindly furnished by those whose names appear at the head of the article, which is a portion of the report on Infant Feeding of the Committee on Dietetics, American Medical Association.]

Question I.—Are malt sugar foods liable to produce abnormal fermentation in the stomach, especially with infants ? Do they often do so ? Can you assign the reason in cases

where it occurs? Is maltose in excess in the food of infants objectionable, and why?

I have never seen any signs of fermentation which I could attribute to the influence of maltose. It is true that all infants cannot digest maltose or malted foods, but even in these cases, I have never seen reason to suspect the difficulty to be due to the fermentation of maltose. (Eustace Smith.)

I believe that all sugar in excess of that normally contained in mothers' milk is liable to undergo fermentation before it can be absorbed, and hence, by interfering with the normal decomposition of the bile in the *prima via*, hinders absorption of fats and possibly of peptones, and so interferes with nutrition. (Rohé.)

It depends entirely upon what form the malt sugar is administered in. In general it must be said of the carbo-hydrates that they are best administered to infants in the form of glucose. Maltose is not a glucose, and ought not to be administered to infants in whom the salivary and pancreatic functions have not been established. In regard to the sugar ferment of the stomach, nothing is known as far as relates to infants. (Uffelmann's case is the only one on record, and that was in a boy.) (Forchheimer.)

Yes. Malt sugar undergoes fermentative changes very readily, and often does harm when used as an ingredient of infants' foods, on account of its fermentation. (Vaughan.)

Maltose can be assimilated by the infant only in very small quantity; when administered in excess it gives rise to diarrhoea, probably owing to its fermentation. It is also objectionable because it starves the tissues, while it increases the fat, giving an appearance of plumpness and health to the infant which, however, is delusive, as seen by its feeble powers of resistance to disease. (Woodbury.)

Question II.—If the Liebig or malt-sugar foods are likely to ferment in the stomach before assimilation commences, is it advisable to add them to cows' milk, in which the resulting acidity tends to transform the casein into indigestible curds?

I do not think it advisable to add maltose to cows' milk in greater quantity than would be necessary to raise the proportion of sugar in cows' milk to make it correspond in this respect to human milk. For this purpose, I think pure cane sugar is preferable to preparations of uncertain composition. (Rohé.)

In Liebig's food the starch is converted into dextrose, as well as into maltose. (Forchheimer.)

It is not advisable to add malt-sugar to cows' milk which is to be used for infants' food. (Vaughan.)

As ordinarily practised, the feeding of children with Liebig's foods with (milkman's) cows' milk, is not advisable and often distinctly injurious. (Woodbury.)

Questions III. and IV.—Should not dextrine be preferred to malt-sugar for ingestion in the case of infants, and, if so, for what reasons? Can dextrine ferment before it is changed to sugar?

With regard to the first four questions relating to the fermentability of malt extract, I think they should be addressed more appropriately to the physiological chemist, than to the physician. (Eustace Smith.)

I have no opinions to offer upon these points. I have seen it stated somewhere that dextrine does not ferment before it is changed into sugar, but this is not remarkable, since dextrine is simply one of the stages of the process by which starch is converted into sugar, or, carrying the process further, into alcohol and acetic acid. But I can readily understand that it may be advantageous to have something for the amylolytic ferments present in the saliva and pancreatic secretions, of even quite young children, to act upon, rather than that these ferments should be mingled with the food in the stomach and intestinal canal, without an opportunity of undergoing their physiological decomposition. (Rohé.)

Dextrine must first be converted into dextrose before it can be utilized by the economy. Dextrine, which is a starch, cannot be fermented until converted to dextrose (grape sugar). (Forchheimer.)

Dextrine is preferable to malt sugar, because it (the dextrine) does not ferment so readily. I do not think that dextrine can undergo fermentation before it is converted into sugar. (Vaughan.)

The chemistry of the different forms of glucose is still in an unsettled condition. I am opposed to an excess of any and all forms of sugar in the diet of infants. Dextrine is partially digested starch, and is readily converted into dextrose by the digestive fluids. It is preferable to maltose, because it affords

an opportunity for physiological activity of the digestive fluids containing ptyaline (salivary and pancreatic secretions, succus entericus). (Woodbury.)

Question V.—Will any of the ordinary artificial “Infant Foods” now in the market thoroughly nourish the child without the addition of cows’ milk?

No artificial food will efficiently nourish an infant unless cows’ milk be added; for all preserved foods want the living antiscorbutic principle which is only to be found in fresh foods. In other respects, many of them, such as the desiccated milk foods, contain in themselves, as far as I know, all the elements of nutrition. (Eustace Smith.)

None of those foods, which I have studied either theoretically or practically, seem to me to fulfil the indications. It seems strange, however, that with the large amount of definite knowledge we possess upon the physiology of digestion, chemists have hitherto failed in giving physicians a trustworthy preparation based upon physiological principles. (Rohé.)

Yes; provided you include milk foods, as ——’s or ——’s. (Forchheimer.)

Yes, there are one or two. (Vaughan.)

I think that a good milk food answers the requirements very acceptably. (Woodbury.)

Question VI.—Do the ordinary so-called infant foods add any constituent to cows’ milk which it does not contain in sufficient quantity already?

I do not think that the ordinary infants’ foods add any constituents to cows’ milk which it does not already contain in sufficient quantity, but many of them, by presenting certain of the constituents in a more digestible form, may contribute greatly to the nutrition of the infant. For instance, few children digest a sufficient quantity of the curd of cows’ milk. The greater part of the casein, in the shape of a dense mass, with the toughness of cheese, passes almost unchanged by the bowels. Where this is the case, the child runs a great risk of being under-nourished unless he assimilates some substitute for the missing curd. This may be supplied by the addition of a well-selected infants’ food. (Eustace Smith.)

None, in my opinion, except sugar. (Rohé.)

Yes. (Forchheimer.)

Yes, the best add dextrine. (Vaughan.)

If the cow's milk is diluted, some of the foods do, by making up the deficiency of carbo-hydrates or hydro-carbons. (Woodbury.)

Question VII.—Should not all the infant foods that are required to be given with cows' milk of ordinary quality be rated in value as sugar only?

I cannot answer. (Eustace Smith.)

Yes, because any other constituents are unnecessary and probably injurious. (Rohé.)

No, salts and some sugar. (Forchheimer.)

Yes. (Vaughan.)

There are many that are inferior in food value to plain sugar. (Woodbury.)

Question VIII.—Do any of the "Milk Foods" contain more than fifteen per cent of solid constituents of cows' milk?

I cannot answer. (Eustace Smith.)

I have before me as I write, a preparation for which the claim is made that it contains fifty per cent of cows' milk. Now, as cows' milk contains only twelve per cent of total solids, there are in this special preparation only six per cent of milk solids. Another preparation in my hands at this moment is said (on the label) to contain fifty per cent of the solid constituents of the milk. The other fifty per cent is said to consist of dextrine and soluble starch. I have had no practical experience with this preparation. However, if the claim made for it is true, this would answer the question in the affirmative. (Rohé.)

Yes, if I understand the question correctly. (Forchheimer.)

Yes. (Vaughan.)

I do not know. (Woodbury.)

Question IX.—Recognizing that the casein of breast-milk is partially a peptone, must not cows' milk, with its tough casein, be poorly adapted to the rearing of infants whose digestion is feeble in comparison with that of the calf?

I think the cows' milk should be specially prepared for the infant's stomach, whether by predigestion or otherwise. (Eustace Smith.)

In practice I have found that many infants can digest the

casein of cows' milk, but this presupposes intelligent feeding, which is not always attainable. Such children, however, much oftener suffer from digestive derangement than nursed infants. (Rohé.)

I do not recognize the casein of breast-milk "as partially a peptone." Human milk does contain a small quantity of peptones, but we are far from certain that they are derived from the casein. (Forchheimer.)

Yes. (Vaughan.)

Yes, especially if the infants are at all delicate. (Woodbury.)

Question X.—In view of the difference in the character of casein of human milk and cows' milk, is it not advisable to have the cows' milk partially predigested, or sufficiently so as to render it like the casein of human milk and as readily digestible by the infant?

Cows' milk should be especially prepared for the infant's stomach, either by predigestion or otherwise. (Eustace Smith.)

If this could be attained in practice, I think it would be a great advance in the art of nourishing children deprived of breast-milk. The preparation referred to (under VIII.) is said to be partly so digested. The claim deserves investigation by experts. (Rohé.)

If cow-casein could be so changed as to be identical in all respects in its properties with human casein, the problem of artificial feeding would be almost solved. (Forchheimer.)

Yes, this is a very important point. (Vaughan.)

"This is a consummation most devoutly to be wished." (Woodbury.)

Question XI.—When farinaceous foods are added to cows' milk for the purpose of preventing the hard coagulation of casein by their physical action, do they not add another indigestible element, and is not their value for the purpose dependent upon their insoluble or indigestible character?

Cows' milk should be specially prepared for the infant's stomach (answer to previous question). If this be attempted by the addition of flour or similar starchy compounds, I think the farinaceous addition contributes little to the nutrition of the infant. (Eustace Smith.)

I think the practice objectionable, at least before the child has reached the tenth month of age. (Rohé.)

It depends entirely upon the age of the infant. (Forchheimer.)

Yes. (Vaughan.)

Yes, the object of adding corn-starch or similar substances is avowedly to make the curd less cohesive, and not to add any nutritive element to the food. (Woodbury.)

Question XII.—Is the peptonizing of cows' milk practical in the household, and can it be uniformly and properly performed by the nurse or mother, or does it require the supervision of an experienced chemist?

The peptonizing of cows' milk is quite practicable in the nursery; the ordinary process does not digest all the curd, but still enough for all practical purposes. (Eustace Smith.)

In a few cases I have been able to make mothers understand the process of peptonizing milk; but, in the majority of instances, my efforts have not been rewarded by success. The proceeding is so troublesome that mothers get careless, and nurses—well, the people who need nurses most are generally unable to employ them. (Rohé.)

No. The method most commonly used (——')s is bad; and it is the only one which can be carried out by the intelligent (!!) attendant. (Forchheimer.)

It should be done under the direction of a competent chemist. Nurses will not do it as it should be done. (Vaughan.)

I consider it impracticable. The women intelligent enough to conduct the process properly are engaged in teaching in some college, and, if married, rarely if ever have children. (Woodbury.)

Question XIII.—For infant feeding should the casein of cows' milk be wholly predigested, or fully peptonized, and if not, why?

I think it objectionable to relieve healthy organs of any of their duties; hence I object, in the interest of the future health of the individual, to wholly prepeptonize, pre-emulsify, or preprancreatize any food. While there may be no exact observations on record, I think a stomach whose peptic glands are not called into use might get altogether out of the habit of digesting, and so be of no more use to the individual than a bag of rubber which had the power of rhythmical contraction. (Rohé.)

I think that peptones (not peptonized milk) can be used to great advantage in proper cases. Peptonized milk is out of the question, as we have no method by which this can be obtained with accuracy. The use of pancreatic ferments, in my opinion, is fallacious, as it introduces into the intestinal tracts, especially very young ones, products that are decidedly dangerous in their actions. I have made some experiments with the ——'s process, which has pushed me to the conclusion that my reasoning is correct. I have seen infants under two months do well on cows' milk, when they would have died with mixtures. One series of experiments was conducted upon foundlings, half of which were given milk undigested, and the other half ——'s digested. The result was that those on milk did well, and the other half had to be returned to milk, otherwise they would have died. Besides, trypsin and stomachic digestion do not agree together. (Forchheimer.)

The casein should not be wholly digested. It is unscientific to feed a child upon food the proteids of which are wholly digested. The stomach must have some work to do, or it will become enfeebled by disease. (Vaughan.)

No. It is unphysiological. (Woodbury.)

Question XIV.—Since pancreatine is itself subject to putrefaction, should it not therefore be used for the purpose of digesting milk *only* when freshly made? Is the offensive odor of some pancreatic preparations that are sold in the market due to impurity or decomposition? Is there danger that such putrefactive changes are likely to impart deleterious qualities to the milk?

The pancreatine should, of course, be used before it has putrefied and lost its properties. (Eustace Smith.)

I think it highly probable that ptomaines may result from the decomposition of pancreatic ferments. I must confess, however, that I have no observations upon this point beyond the violent appeal to my olfactories made by some pancreatic preparations. (Rohé.)

Whatever has been said about ——'s, is true of all pancreatic products. (Forchheimer.)

Yes, the offensive odor comes principally, I think, from impurities; though some pure preparation, even if it could be obtained, would probably decompose. (Vaughan.)

Unless nastiness be a recommendation, the commercial digestive preparations should be excluded from the household. (Woodbury.)

Question XV.—What proportion of cows' milk found in our large cities during the summer months is in a proper condition to feed children? Is not the cause of the great mortality at this season largely due to the fact that fermentative changes take place in the milk before it reaches the consumer?

In large cities during the summer, cows' milk brought from a distance is, no doubt, often far from fresh, and therefore ill-adapted to further healthy nutrition, if not actually injurious to the recipient. (Eustace Smith.)

Sanitarians are agreed that the methods of milk supply in large cities urgently demand reform. There is no doubt that during the hot weather of summer decomposition sometimes occurs in milk which renders the latter violently poisonous. The outbreaks of tyrotoxicon poisoning so well studied during the last two years by Professor Vaughan, Drs. Newton and Shippen Wallace, and Professor Shearer, of Iowa, prove this. Added to this danger is that of allowing milk from tuberculous cows (and nearly all city cows are tuberculous) to be sold. I have advocated the inspection of milk by qualified officials in this city, but I am not sanguine that such inspection would remove the most serious danger, which is not adulterated milk, but milk that is unwholesome or dangerous from other causes. (Rohé.)

I know of but three milkmen in this city (Cincinnati) who supply milk which can be absolutely relied upon in summer. Yes. (Forchheimer.)

I think that poisonous milk is the cause of a large per cent of the mortality among children, especially among the poor classes of our large cities. It would be impossible to say what proportion of the milk supplied to the cities becomes unwholesome in the hands of the small retail dealer, and also after it has been sold to the poor, who have no means of keeping it at a low temperature and in a non-vitiated air. (Vaughan.)

To the dangers from adulteration with ditch-water or that from infected pumps, we have that from metallic poisoning by the cans. (See article by Dr. George Hull, Philadelphia *Medical Times*, Vol. XVII., p. 256.) (Woodbury.)

Question XVI.—What recent advancement has been made in foods for infants that is worthy of consideration in furnishing us with an artificial food at all analogous to, or approximating toward, human milk in composition and digestibility?

I have no personal knowledge of such advancement. (Rohé.)

None. The last one was only applicable to individual cases, however. (Forchheimer.)

It is possible that such an advance has been made; the matter is still under trial before the profession. (Woodbury.)

I think that the addition of dextrine instead of sugar or starch to the milk solids and the partial digestion of casein are important advances. (Vaughan.)

Dr. J. Lewis Smith, New York, writes as follows :

April 24, 1888.

According to my observations, babies can digest dextrine readily, even those under the age of three months, who digest starch with difficulty. I have during the last two years employed in nursery feeding, with the best results, wheat flour, prepared by being boiled five days, dried in a bag and then grated and sifted, and placed two days in pans in an oven at a temperature of about 100°. The starch by this process is largely converted into dextrine, but not into glucose, and the flour has the reddish yellow color of dextrine. When kept for use, I believe it is more stable than the glucose preparations made by Liebig's formula which are found in the shops. But milk should be the basis of all infantile foods. Neither starch, dextrine, nor glucose sufficiently nourishes without it, but we may use one of these foods without milk for two or three days in unsettled states of the stomach with good results. If we use starchy food, it should be boiled several hours, which changes a portion of the starch into its soluble form, the first stage in digestion. Barley flour or oatmeal, thus prepared, will often agree with infants, but not so certainly as dextrinized starch.

I think that it is not best to feed infants habitually with fully digested food, for the stomach of the baby should be allowed to accomplish what it can without being overtaxed. Its normal functional activity produces a healthier state, and conduces to a better condition of the infant, in my opinion, than when there is no functional activity except that of assimilation, as

is the case when fully digested food like glucose is given. The same rule applies, I think, to the digestive organs as to the muscles. If we insist on quietude of the muscles, they atrophy and become feeble. If we fully predigest the infant's food, it seems to me probable that glands or follicles which furnish the digestive ferments, lacking the needed stimulation, are likely to suffer deterioration in their functions and furnish ferments of poorer quality and of less quantity, than when the food is of a nature that requires some digestion. For this reason, I regard favorably the use of the dextrine rather than the glucose preparations obtained from starchy foods. It has long been the belief of some of the best authorities in the dietetics of infancy, that farinaceous substances, as barley flour, added to milk tend to prevent, by mechanically separating the particles of casein, the formation of large and indigestible coagula of this substance in the stomach. This has been one reason of my preference for the use of partially-converted or partially-digested starch instead of glucose in the feeding of infants, for glucose being completely soluble cannot have this mechanical action.

DR. L. A. SAYRE, OF NEW YORK :

Mr. President : I was so fully impressed by the paper read by Dr. Woodbury, that it seems to me to be the duty of this Association to take some further stand in advising the country at large in regard to the feeding of the rising generation. The wretched dosing that the majority of people have to stand in the way of food, is carrying our children to the grave by the score.

The Association should appoint a committee of competent men to investigate and keep before the public some facts in regard to this most important subject.

I therefore propose the following resolution : That the Committee on Dietetics be continued and empowered to enlarge its number, and that the Committee of Arrangements are hereby empowered to give this committee and its work a proper place in the programme of the next meeting. (Applause.)

DR. BENJAMIN LEE, OF PHILADELPHIA :

Mr. Chairman : I had already prepared a motion to the same effect, and I should like to amend the resolution which

has been offered by adding "That this committee be, and is hereby instructed to present a report at the next meeting embodying the general principles to be observed in a rational system of dietetics."

DR. SAYRE : I accept the gentleman's amendment.

The amendment was put and carried, and the original resolution as amended was then put and unanimously carried.

ARTIFICIAL FOODS.

Abstract of Paper read before the Section by Charles W. Earle, M.D., Professor of Diseases of Children, Women's Medical College, Chicago.

As an introduction to what I have to say in regard to infant feeding it will be particularly appropriate to present to you a brief *résumé* of what Baginsky, the latest German author on "Kinderkrankheiten" writes on the subject.

It is appropriate, it appears to me, for several reasons : First, it gives to you the ideas of a leading advanced man on the subject, which is more than would come to you, perhaps, did I not quote from him. It presents to you, secondly, his conclusion in regard to the terrible mortality where a parent deprives her child of maternal nourishment, and also shows how much greater has been the effort with us to furnish a substitute for mothers' milk. Possibly this is to our discredit.

The greatest of mortalities in all times and among all nations is due to the lack of mothers' milk. In Berlin, one half of all the children born out of wedlock die within six months, and during the summer months a very great number of all children succumb to errors of diet.

The question *par excellence*, rising above all others, is infant diet.

Next to mothers' milk comes the wet nurse.

Artificial foods are divided into two classes :

In the first group are enumerated,

Cows' milk,

Peptogenized milk,

Condensed milk,

Cream mixtures,

Liebig's foods.

While in group two are found the prepared foods.

The first class of artificial foods is substituted from the birth of the infant, while the second is particularly adapted to somewhat older children and may be given as adjuvants to mothers' or nurses' milk.

The difference between mothers' milk and cows' milk is given in general terms as follows: the water is about equal, casein, albumen, salts and butter, a greater quantity in cows' milk, and of sugar less.

This analysis as regards the fats does not agree with the usual analyses. He also says that coagulation and fermentation arises sooner in cows' milk than in mothers'. According to Dogiel there is not as much difference between mothers' and cows' milk as has been formerly supposed. Out of cows' milk it is possible to manufacture a substitute which in almost every essential is equivalent to mothers' milk. The greatest difficulty is to obtain good cows' milk, and this is why condensed milk is frequently the best substitute which can be provided. Cows' milk if given to babies should not be administered raw, but boiled long and thoroughly in order to destroy bacteria. Germs of tuberculosis can be effectually destroyed if they exist in cows' milk, by thorough boiling. Soxhlet's cooking apparatus is spoken of as the best and safest to destroy the germs found in milk. By the use of this process cows' milk is much better as a child's food than we have formerly thought. On account of the protean substances, however, the milk should be diluted, and there should also be added a little milk sugar. The digestive powers in children are different. Some bear one thing well and another child something else better. One takes a great amount of fat and thrives, others demand less, and if the same amount of fat is given disease ensues. Cows' milk should usually be prepared in proportion of one to three for young children, later in equal parts. Some children at nine months can take clear milk and digest it perfectly. A curious fact is developed in the dilution of cows' milk, in that from at first being one to three, this proportion is lessened about fifteen per cent during the first two months, and then increased until equal parts of water and cows' milk are used. Two methods of preserving milk are presented. First, it is condensed with sugar, and second

without this ingredient. The great trouble in the condensing process is, that too much sugar makes it indigestible, and if you take a milk of this kind and dilute it so that it can be digested it makes it too weak. Every can of condensed milk should be separately inspected.

Peptonizing food is not a new idea. It is very old, and great difficulties have been found in bringing about the process, and it is not regarded with great favor by the authority from whom I am now quoting. Biedert's cream mixture contains no more than a single per cent of casein, and agrees excellently well in a large number of cases. Liebig's foods and soups are made from milk, wheat, and malt, but it is believed that the cream mixture mentioned above, when fresh and properly made, is better than Liebig's Food. Nestlé's Food is spoken of as being the best type of a prepared food. It contains forty per cent of sugar, five of fat, fifteen of protean compounds, and thirty per cent of dextrine and amylum. It has been noticed that a long continuation of the administration of an artificial food, in some cases, at least, brings about a change of blood. The red corpuscles diminish, but they can be increased if a wet-nurse or mothers' milk is substituted.

This much for an introduction, and a statement of what is so greatly desired—a substitute for mothers' milk.

Some one of the old authors, whose name I cannot now give, has said that "Nature does not afford, nor can art supply a substitute for mothers' milk."

So firm is my belief that no artificial food can be selected which will furnish a proper nutriment through the hot months to a considerable number of these little people whose mothers cannot or will not nurse them, that I am every year coming to suggest with greater frequency a wet-nurse. I know full well what a wet-nurse in many families means. Many of them are conscientious, and do everything possible to nourish the little charges placed in their care, while others are totally irresponsible and corrupt in the extreme. If, from any cause, the mother cannot nurse her baby, and from certain other causes a wet-nurse cannot be provided, then, of course, either an entire or partial artificial diet must be provided. A *mixed* diet is preferable to an artificial one, that is, part mothers' or nurses' milk, with the remainder supplied from some outside

source. A little mothers' milk for a sick day or while a tooth is erupting is most valuable.

At the first, then, we must acknowledge three facts :

1. That mothers' milk is the food *par excellence* for a baby.
2. If this cannot be furnished, in large cities, at least, a wet-nurse should be procured.
3. If, for causes which I have now enumerated, the mother cannot supply the nourishment, and if from causes over which we have no control, a wet-nurse cannot be secured, an artificial diet must be furnished. And that if the mother or a wet-nurse can provide only part enough nourishment for the child, it is better to fill in with some of the substitutes, such as cream, cows' milk, or some of the prepared foods, than to try to bring up the child upon a strictly artificial food.

One of the first occasions at which we may be called to supply an artificial food for a baby comes in a case where a child is prematurely born. In part of these cases the milk secretion of the mother is at once established and the child is nourished from the very commencement with the food which its little non-developed digestive apparatus can best provide for ; in others several weeks may elapse before the milk secretion is established, and during that time something must be provided for its nourishment. Several have already come under my care. I have notes at this moment of three infants born between the sixth and seventh months, where an artificial food from necessity, had to be provided. I have succeeded in saving these lives on an artificial food. Cream is the basis, barley-water the menstruum, to which is added a little salt, a little sugar of milk, and a small amount of lime-water.

A prematurely born baby should be fed a small quantity frequently. Sometimes not more than a half teaspoonful, and when not fed from the spoon let an ordinary ounce bottle be provided with a rubber mouth-piece. I have no use for the large nursing bottle provided with glass and rubber tubings and brushes. I regard them, with all their appliances, particularly for a prematurely born child, a fraud and a snare. For the first few days, perhaps, cracker-water with a small amount of sugar of milk is all that is necessary. Then cream added to a little cracker-water, or cream and rice-water ; then cream and barley-water, and, if vomiting takes place, a small amount

of lime-water should be added. If from any reason the cream does not agree with the baby, condensed milk with barley-water, a little salt, and possibly the addition of a little lime-water. By varying the amount of cream, using either barley-water or rice-water as the diluent, adding a little sugar of milk and a little grain of salt, and sometimes a little condensed milk, when from any cause the cream disagrees with the infant, one is able to carry along one of these puny children until such time as the milk secretion is established.

Coming to consider the use of artificial foods, we should state in unmistakable terms to mothers that because one baby has been brought up on a given artificial food, it does not follow that the same food will agree with the next baby. One food nourishes a given baby well, but may, if administered persistently, kill the next baby.

My trouble has been to find a food that would, in the first place, agree with a baby, and secondly that would nourish it.

Cows' milk will agree with some babies, but in many cases its administration is followed by vomiting and passing great masses of curds (casein). Manufactured foods are frequently retained by the child, but he emaciates, and may die from inanition.

Among the foods which I have found suitable for very young children, I would mention cream and barley first, cream and oatmeal-water or rice-water, condensed milk, with some restrictions, Nestlé's and Carnrick's foods and Malted Milk. I should not fail to speak of the white of egg as a substance very easily digested by children with weak stomachs, and which gives to them a very fair degree of nourishment. Then comes Mellin's Food, Imperial Granum, and Ridge's Food for older children. I speak of these foods after considerable study and rather extended experience with them, and do not place any as first, or in any degree a perfect food.

The So-called Milk Foods.

The best examples of so-called milk foods are Gerber's and Nestlé's. The first I have had very little experience with, but know that it has agreed excellently well with a few children.

Nestlé's food is made very much like it, and is with us a

very popular food. Some Chicago druggists say that more Nestlé's Food is sold than any other infant food on the market.

Condensed milk forms the basis of Nestlé's Food. To this is added a certain amount of wheat flour, and, as stated by some, oatmeal. This substance is then made into biscuits, thoroughly cooked, ground minutely and mixed with the condensed milk. This is then dried by slow heat, ground, and sufficient wheat gluten is added to bring up the albuminoids to the same per cent found in human milk. (Leeds.)

Whether this is the exact method of making this food we do not know, but we do know that all of these milk foods have a good per cent of albuminoids, fats, and salts, and that by baking, some of the starchy parts are converted into dextrine and are easily assimilated.

It is claimed that a large part of the starch is not converted, and in none of these foods has the casein of the milk been predigested, and the character of the casein is not at all changed. Notwithstanding this fact, we know that at the bedside Nestlé's Food agrees with a very large number of children.

Condensed Milk.

The great trouble in the use of condensed milk is, that not enough is used. Every one should understand that milk is only condensed four times, and that a small amount will color a very large amount of water. The people do not understand this, and I am afraid that physicians do not take the trouble in many cases to investigate it. One teaspoonful of condensed milk will color twelve ounces of water, and I have known this to be given as a food to an infant. It is a starvation diet, and in the majority of cases sooner or later the child develops symptoms of bad nutrition.

In my experience the youngest infant will take condensed milk in the proportion of one to ten or fifteen, that is, barley or rice-water, ten to fifteen parts, condensed milk, one part sugar of milk, salt, and the phosphates. Even this will only be sufficient for a short time, and one must soon either add more condensed milk, or to the same food, cream. The agreement with each individual case, in less or increasing quantities, is the only safe rule for our guidance.

Objections have been made to condensed milk, and in all

probability some of them are valid. We have already remarked that this food does not in all cases agree with infants.

It has been claimed that the character of the casein is unchanged. It is possible that the diluent, barley or rice-water, may correct this to some extent. Certain it is that condensed milk with the above diluent agrees well with some children.

It has also been claimed that the large amount of cane sugar or glucose used in the preparation of condensed milk, makes it more susceptible to fermentation. I am not aware that this objection has been removed, unless it is in a condensed milk made without sugar.

After the milk foods come, it appears to me, the so-called Liebig's preparations. Some of these are used with cows' milk, and by this addition it is claimed that we obtain very nearly a preparation corresponding physiologically with mothers' milk.

It is claimed for Mellin's Food :

That it is a soluble dry extract from wheat and malt.

That it is perfectly free from starch and cane sugar ; the starch being converted into dextrine and grape sugar.

That it is entirely free from husks, indigestible inert matter and animal germs.

That it contains a large amount of proteids (albuminoids) and soluble phosphates, and that it is alkaline in reaction.

It is not claimed that this food has sufficient fat to nourish a child, and to supply this cream may be added. It is claimed, however, that by its addition the albuminoids are so changed that small flaky curds are formed in place of hard, dense ones. This food certainly has stood the test, and at the bedside has been found of great value in the practice of those who are studying this subject, and whose opinions are worthy of respect.

These are composed largely of barley, malt, and wheat flour, and starch, which has been converted into *maltose*. These foods will not nourish a child sufficiently without the addition of cows' milk, and as their constituents (Mellin's and Horlick's foods) are nearly the same in nutritious value as cows' milk, it is urged that they do not add anything to cows' milk, except sugar and an alkali. It is claimed that the addition of the maltose does not prevent the formation of hard

coagula from the casein of cows' milk. From experiments which I have recently made—and my thanks are due to Professor Salisbury of the Woman's Medical College, for assistance—it seems that the claim which is made by the advocates of the Mellin Food is true, and that the addition of this food to cows' milk does cause it to break up in very small flaky curds. The fact that these foods contain a considerable amount of maltose, and are sometimes laxative to babies, possibly is true, but this may be said of most any other food.

Malted Milk.

This is a new food, but from personal observation I can testify to the fact that it is of value in some cases. It has agreed with several very young children when other foods would not. The principle involved is that the diastatic action of malt is most closely allied to the active principle of saliva—the pancreatic and intestinal juices. It is made as follows: "In malted milk we present pure fresh cows' milk, combined with the extract of selected wheat and malted barley in a dry-powdered form, perfectly soluble in water, requiring no cooking, or the addition of milk, and free from starch."

This food requires no cooking, neither the addition of milk, and is said to contain no starch.

It is objected to by some from the fact that it contains a large amount of maltose, and is liable to abnormal fermentation, the same as we find in Liebig's Food.

Peptogenic milk powder is claimed to be the safest and best physiological imitation of mothers' milk, and is composed of milk sugar—the mineral matters and pancreatin. It is a substance to be added to cows' milk in order to make it possible for a child to digest the milk.

Theoretically, this milk should be very nearly the correct food; but, practically, we find that it disagrees with a considerable number of babies. The greatest objections are that it is not practicable in the household, because it requires scientific skill to properly predigest the food, and that many irregularities of digestion will certainly come about from this preparation. Recent writers have claimed that pancreatin is extremely liable to putrefactive changes, and that if it is used, it must be fresh and sterilized by heat. Foster says that

“pancreatin, unless absolutely pure, swarms with bacteria.” The theory of this food is good ; practically it does not come up to the standard. It has been suggested that if this food is not rich enough to nourish a baby, cream may be added at each feeding.

It has been claimed by Professor Vaughn that preserved dry milk, if properly done, will keep for any length of time ; and it is claimed that of the many hundred thousand cans of this food, which have been placed upon the market during the past three years, not more than a dozen of them have been returned in bad order.

Carnrick's Food is composed of forty-five per cent of powdered milk, forty-five per cent of dextrine, and ten per cent of milk sugar. It is partly predigested, so that the casein is as readily digested by an infant as it is in human milk. Dextrine is used in place of maltose for the following reasons : Dextrine is not fermentable until changed into sugar. The youngest infant can supply sufficient ferment to digest dextrine, and when the process of digestion is under way, abnormal fermentation is not liable to occur. The milk is only partly predigested, because it is not advisable to entirely digest any food before ingestion.

Finally, it is claimed of Carnrick's Food that it is the only artificial food which will thoroughly nourish a child without the addition of cows' milk ; that it approaches nearer human milk in composition and digestibility than any other artificial food, up to this time, that has been placed upon the market. It is also claimed that it will agree with a larger number of children than any other artificial food.

Personally, the food has agreed with children in my practice, and has certainly “bridged over” some who have not been able to take any other food. In my experience it is hardly rich enough, however, and fat in the shape of cream must be added.

It has been generally conceded that starch cannot be digested by young infants, from the fact that their digestive fluids are lacking in certain constituents. Upon this basis certain foods which are known to contain starch had been objected to. Theoretically, it is probably true that babies—at least a large number of them—cannot digest starch, yet, practically, we

know that some babies do take care of this kind of food excellently well. According to rule a baby or young child should not eat potatoes ; this kind of food should disagree with them. As a matter of fact, we do know, however, that some children thrive excellently well upon this kind of food.

Imperial Granum and Ridge's Food have been placed in this class, or as farinaceous foods. They have been tried and tested for a long period, and it must be confessed that for older children they do well in many cases. Time will not permit me to enter into the details of manufacture. They are made largely from the best of flour, made very fine, and thoroughly cooked, by which a large part of the starch is changed into dextrine.

In the Foundlings' Home in Chicago, for very young and undeveloped babies cream foods take the preference ; then comes Nestlé's Food, and afterward, for older children, Granum. Ridge's Food is a favorite ; but the peptogenic milk foods have fallen below the standard.

Probably one of the most important questions which should engage our attention is the

Fermentation of Milk.

Fermentation of milk occurs only in consequence of the introduction into it of micro-organisms. If the milk be received by a sterilized tube into a sterilized receptacle directly from the udder of the cow, it will not ferment nor become acid, though kept indefinitely. But except these precautions are taken, the germs always gain access to it, consequently in order to prevent its fermentation, it is necessary to heat it. It can be sterilized by heating to 70° for an hour by which process the adult bacilli are killed, but in order to kill the spores it is necessary to repeat the process for an hour each day for four or five days. Heating to 100° by a current of steam for one hour will sterilize it completely, but boiling coagulates the albumen and to some extent changes the milk sugar. The first process in the fermentation of milk is due to the action of a bacillus, and consists in the conversion of the milk sugar into lactic acid. This process ceases after a small quantity of acid is formed, but if the acid be neutralized by chalk, the fermentation will go on until the milk sugar is all

decomposed. By the change of reaction of the milk the casein is coagulated. This coagulation is said to be due to the action of the acid and not directly to that of the bacillus. When the milk sugar is converted into lactic acid, another bacillus—*bacillus subtilis*—attacks the lactic acid and converts it into butyric acid with evolution of carbon dioxide and free hydrogen. This bacillus cannot act on milk sugar unless it is first converted into lactic acid.

Under exceptional circumstances there is formed in milk a substance first discovered by Professor Vaughn, of Ann Arbor, and named by him “*tyrotoxicon*” (cheese poison). This substance is a crystalline nitrogenous substance, and is supposed to be a ptomaine. When taken it produces pain at the base of the brain, vomiting or retching and purging. When given to an animal similar symptoms are produced. Professor Vaughn believes this to be the cause of cholera infantum. *Tyrotoxicon* is formed spontaneously in milk after some months; and it will be produced very quickly if some milk in which it has been formed be added to fresh milk. Its formation seems to be connected with the butyric acid fermentation.

In conclusion I have to repeat my quotation made at the opening: “Nature does not afford, nor can art supply a substitute for mothers’ milk.”

1. Mothers should be encouraged by every argument possible to nurse their children, and the dangers of too early weaning for trivial causes should be demonstrated to them.

2. If from causes which we cannot control and which seem rational and valid, a mother cannot nurse her child, then, in cities, at least, a wet-nurse should be procured.

3. A mixed diet is preferable to an artificial one.

4. For very young infants in lieu of mothers’ or nurses’ milk, cream with barley, rice or oatmeal-water, to which milk sugar and either common salt, phosphate of lime, or lime-water in small quantities is added, seem to agree best.

5. For older children cows’ milk and the so-called milk foods, and it would seem from some recent analyses of cows’ milk, that if all kinds of fermentation can be prevented that the task of preparing cows’ milk so that it will agree with infants, will not be as difficult as it has formerly been. It also seems that

it is along this line that investigation should in future be made. We must not only insist that good milk shall be provided, but also that it shall not have in it bacteria. If milk is used let it be thoroughly boiled, and for a long time; if it is diluted with water, let it be absolutely pure; if the attempt is made to make it more nutritious by the addition of cream, let it be that which has not already undergone partial decomposition. The sugar added should be pure milk sugar, and if a small amount of wheat or flour is used, this, too, should be thoroughly cooked.

6. If artificial foods are used, let the clinical test decide which shall be selected, and when one food is found to agree with a child, let the growth and increasing nutrition of that child, or its loss in weight and commencing atrophy, be the guide for the substitution of some other food. I cannot designate particular foods for reasons perfectly obvious. Every food has its advocates; every food has its chemical analysis which proves, without any shadow of doubt, that it is chemically and physiologically the only substitute for mothers' milk, and yet every one of them sometimes fails us. I will admit that this is true of mothers' milk in rare cases. But, as a rule, let our advice be in the order I here name—mothers' milk, pure milk, cream foods, milk foods, malted foods, farinaceous foods; always pure, free from bacteria, and each preparation, whatever it be, frequently inspected.

HYGIENE.

AN ADDRESS DELIVERED BEFORE THE MEDICAL SOCIETY OF
PENNSYLVANIA, PHILADELPHIA, JUNE 5TH, 1888.

By TRAILL GREEN, M.D., LL.D., of Easton, Pa.

IN reviewing the reports which have been made before this society by so many able members of our profession, examining the many excellent treatises which have been written on hygiene, and considering the great attainments which have been reached in hygienic science, we find no reason for the belief that our knowledge of the subject has not been largely in-

creased. But may we not ask, Can we with equal certainty say that this knowledge has reached to any considerable degree the families in which we minister? What, for example, do we find to be the practice of many of our people (and I do not refer to the lower classes only) with reference to the importance of pure air in our dwellings? Many remain during the winter, by day in rooms which are not ventilated and by night sleep in apartments into which no pure air is admitted, while the occupants are consuming the air which the rooms contained when they retired for the night. Is there not a very general belief that night air is in some way exceedingly injurious, and therefore must be carefully excluded? Do they not know that it is the only air to be had after sunset, and must be used or respiration cease?

As regards ventilation, many architects and builders must be very ignorant, or they plan and build in accordance with the ignorance of those who are to occupy the houses which they arrange for them. Not long ago I examined a house that was erected for a wealthy gentleman, who was about to occupy it. I examined it, that I might learn how far it had been constructed with reference to the health of those who were to make it their home—to spend most of their time within its walls. It is a large double house, and apparently properly built. I was particularly interested to learn whether the architect had made provision for ventilation: not a flue or register could I find in any room in the house. I met the mason who had been employed to do the mason work. I remarked to him: “That building which you and the carpenter put up is very like a merchant’s packing box, and does not meet the ideal of a properly constructed modern house. I could not find any arrangement for ventilation.” The mason replied: “There are flues for all the rooms in the house.” I said, “I could not find them.” “No,” he replied, “we plastered all of them up.” The carpenter who built the house was the principal builder in the town. I had occasion to direct the construction of an addition to a parsonage some years ago. I employed a man who possessed an excellent trait of character, which was that he would do what he was directed to do. The same carpenter to whom I have referred went to examine the work, and asked this man what he was doing? He replied,

"I am building a flue as the doctor directed." "Well," said the carpenter, "it is of no more use than a fifth wheel to a wagon." The work was completed according to the plan, and the family who occupied the house found the addition to be the most pleasant part of it. When any member of the family was ill, he was always taken to this room, where the air was pure, helpful to recovery, and pleasant to the nurse.

A scientific sanitarian who is greatly interested in the subject of ventilation, was conversing with a member of a church in this city on the subject. The latter remarked, "The church in which I worship is well ventilated through openings in the ceilings." The scientist visited the church shortly after this conversation, and discovered that all the ventilation was due to a fresco-painter, who represented openings in the ceiling so well that the members of the church supposed that they were real openings through which the air which they had breathed passed out of the church.

Dr. Isaac Ray, known to many of our society in his interesting little book on mental hygiene, makes this relation: "A gentleman, who for many years sat upon the Supreme Bench of Massachusetts, which he had honored by his learning and integrity, and who, in the course of his life, had in all probability inspired more bad air than any other professional man of his time, used to express his surprise that so much was said about pure air and bad air, because 'it seemed to be all alike to him.'"

An intelligent man who had very good knowledge of the value of pure air, told me that he had been in the habit of introducing a good supply of pure air into his bedroom on leaving it in the morning. His wife, who remained in bed, asked him: "Why do you allow so much air to enter the room when you leave it in the morning?" He replied, "If you will rise and go out of the room while it is closed and return to it you will learn why I open the windows." And so will every one who sleeps in a room which is not well ventilated.

In a distinguished scientific school in this country there is utter neglect of the laws of health connected with pure air. Classes succeed each other hour after hour without a change of air. The building was constructed very properly, but ventilators are not kept open. All the teachers are familiar with

the laws of health, and the effect of breathing such air as their pupils breathe every day.

From all this we see that builders, housekeepers, intelligent judges, and scientific teachers are entirely ignorant of the value of pure air, or wholly indifferent to apply the knowledge which they possess.

Another of the bountiful gifts of the Creator—water—is too little used to cleanse the skin. I need not dwell on this—you are familiar with the ignorance or negligence of many for whom you prescribe.

Not long ago a man applied for admission to one of the hospitals of this city. He was examined, and the physician in charge called one of the assistants to take him to the bathing-room and give him a bath. The man objected and said, "I bathe twice a year and not oftener; I bathed myself a short time ago, and will not be bathed now—I would rather have my disease." The physician would not recall his order and the man left the hospital. I have been surprised when attending sick children, and having prescribed a warm bath, often so soothing and so remedial in many of the diseases of children, to hear mothers say, "Doctor, I could not use it, my child would be so frightened that I would fear the result. I never gave it a bath."

I suppose all of us have learned that a child accustomed to the use of water in this way is greatly delighted when placed in the bathing-tub, and the mother finds it difficult to get the consent of the child to be removed from the tub when it has been for a proper time in the water. It will be easily seen that a child reared with this dread of a bathing-tub will not be likely to become a friend to the external use of water. From what many of us have learned in the sick-room we can testify that the use of water to remove excreta from the skin, and foreign matter deposited upon it, is greatly neglected, or very seldom used; one cannot practice medicine for any length of time without discovering that there is great fear that changing the linen of sick persons, and the sheets of their beds, is not without danger to the sick. Cellars are not kept as pure as the health of households requires—decaying vegetables are often allowed to poison the atmosphere of the house; that there is neglect is discovered in the unpleasant odor frequently

noticed in the upper rooms of otherwise well-regulated homes. Yet there are persons who will take the damp, offensive air of the cellar and send it throughout the house to be breathed by the family. Many instances of this kind can be found in every community.

The house water-closet and the stationary washstand still present difficulties in hygiene which, it seems, cannot be met. One of the ablest architects said to me not long ago : " When I built my house I placed a stationary washstand in every bedroom in the house ; were I building now, one would be sufficient."

A distinguished chemist of another city, in company with several scientific men, said : " What can we do to keep our houses pure ? My wife called me to examine one of the washbowls. A great quantity of green fungous matter came out of the drain-pipe into the bowl." Is this favorable to health ?

What shall we do ? Boards of health can do much. Every physician should, to the families under his care, point out the violations of the laws of health. We have not made much progress. The people seem not to follow the light which we suppose they have. We must begin farther down. The necessity for pure air and the free use of water must be impressed upon the minds of our young people. Through our schools, where there is physiological instruction, will the generation now growing up have better knowledge of hygienic matters. Non-professional persons have observed the neglect of the laws of health.

" Take so simple a matter as ventilation. So far as my observation goes the school-room, factory, church, or public hall, to say nothing of private dwellings, in which the principles of ventilation are adequately applied, is the rare exception, not because the arrangements for it are expensive, but because the knowledge involved is in possession of so small a number. The sweltering majorities live their lives and do their work under conditions, where not only their comfort, but often their safety depends upon the knowledge of simple truths of which they are ignorant." [" The Advancement of Science in its Relation to Education."—W. B. OWEN, Ph.D.]

There are several subjects which belong to mental rather than physical hygiene, which have not, as far as I know, been

discussed before this society ; but they are so closely connected with it by their influence on the body that they may properly be discussed in the half hour allotted to me for this paper. One of these is the fear of suffering in the hour of death.

Shakespeare, in "Measure for Measure," Act I. Scene 1, makes Isabel say : "The sense of death is most in apprehension."

And Casca, in "Julius Cæsar," Act III. Scene 1 : "Why, he that cuts off twenty years of life cuts off so many years of fearing death."

You have doubtless observed many cases of good people who had, during a long life lived in dread of physical suffering in the hour of death. I attended, many years ago, an excellent man, a rector of an Episcopal church, for disease of the heart, with the usual attendant, dropsy. His wife said to me on one of my visits : "Doctor, my husband has had great dread of death, believing that it is attended with great physical suffering ; excepting this he has no fear." I replied : "Madam, I have no doubt that his fear of suffering will not be realized. He will pass into a gentle sleep and will unconsciously enter into that future life in expectation of which he has lived." In a very short time, on a Sabbath afternoon, he passed into an unconscious state, and on the following morning entered upon that blissful life for which he was prepared.

I attended a nervous patient, a good woman, who had often expressed to me her fear of the suffering in the hour of death. I stated to her what I had often observed at the last hours of the dying. She lived beyond the allotted period of three-score and ten years. I attended her in her last illness, a chronic pulmonary affection. I was at her bedside between nine and ten o'clock in the evening with her children. A few minutes were spent pleasantly with her, and I bade her good-night. There was no indication of approaching death. She passed, as I was informed, into a pleasant sleep. In less than two hours one of her sons called to inform me that his mother was dead, going into her last sleep as gently and quietly as in her childhood she fell asleep in her mother's arms.

I could furnish instance after instance of the same kind did time permit, and I am sure the experience of the practitioners present will confirm what I have stated. You will not mis-

take that other view of death, as remarked by the author of the Epistle to the Hebrews, chap. 2 : 15—that fear which Christ came to allay—“ And deliver them who through fear of death were all their lifetime subject to bondage.”

As it relates to physical suffering, the manner of death by the brain, the lungs or the heart, is sufficient to prove that there is unnecessary fear of suffering in the last hour.

The Scripture account of death usually is : “ He fell asleep.” The Greek word, *koimeterion*, from *koimao*, “ I sleep,” from which our word cemetery is derived, beautifully expresses the Scripture idea, a sleeping place.

There are no cases of death in which the suffering seems so certain as in pseudo-membranous laryngitis. Dr. J. C. Rushmore, of Brooklyn, in the *New York Medical Journal*, May 9th, 1888, p. 542, writes : “ In regard to the history of the case, if the operation (tracheotomy) is not done, my experience has been that death is not nearly so painful as I was at first led to suppose. I make this statement with some hesitation, in view of the fact that many authors advise the operation on the ground that even if the case has a fatal termination, the distress is less than without it. I am speaking now, of course, of those cases where dyspnœa is due to mechanical causes. When patients have died from laryngeal obstruction alone, the picture has always been the same—gradually increasing restlessness and dyspnœa, with paroxysms of spasms added at times, and threatening death ; then the spasm is relieved in a few moments, but a very considerable amount of distress continues, and then a rather rapid development of unconsciousness, the coma continuing for several hours, and the patient dying quietly, the breathing being still obstructed. And this is so uniform in my experience, that I have been in the habit of telling the patients' friends that, even if the operation is not done, the patient will not choke to death, with great struggling and distress, but will die unconscious and with comparative ease. The same change takes place, of course, minus the laryngeal spasm, in those cases where death is due to the extension of the membrane below the tube, and due to the same condition of imperfect aeration of the blood, with its effects on the brain and on the circulation.” On this subject it is pleasant to observe the benevolent arrangement that has been made with reference to the lower animals.

There is in the arrangement of Providence, benevolence to the lower animals, and why should not the manner of death in the human family be as kindly ordered to prevent the agony of dying?

Dr. Livingstone, the distinguished African missionary, described his sensations when attacked by a lion: "I was upon a little height, he caught me by the shoulder as he sprang, and we both came to the ground together. Growling horribly close to my ear, he shook me as a terrier dog does a rat. The shock produced a stupor similar to that which seems to be felt by a mouse after the first shake of a cat. It caused a sort of dreaminess in which there was no sense of pain, nor feeling of terror, though quite conscious of all that was happening. It was like what patients partly under the influence of chloroform describe, who see all the operation, but feel not the knife. This singular condition was not the result of any mental process. The shake annihilated fear, and allowed no sense of horror in looking round at the beast.

"This peculiar state is probably produced in all animals killed by the carnivora, and if so, is a merciful provision by our benevolent Creator for lessening the pain of death."—["Livingstone and his Life Work in Africa," p. 143.]

It is pleasant to find in the eloquent writings of Sir Thomas Browne, M.D., reference to this subject. He says: "The certainty of death is attended with uncertainties, in times, manners, places."—["Hydriotaphia," p. 316.]

"The knowledge of future evils mortifies present felicities, and there is more content in the uncertainty or ignorance of them. This favor our Saviour vouchsafed unto Peter when he foretold not his death in plain terms (John 21 : 18, 19), and so by analogous and cloudy delivery damped not the spirit of his disciple."—["Christian Morals," p. 217.]

"To preserve the living and make the dead to live, to keep them out of their urns, and discourse of human fragments in them, is not impertinent to our profession, whose study is life and death."—["Hydriotaphia," p. 279.]

There is another subject which is a cause of painful anxiety to many persons, which is the possibility of being interred before life has become extinct.

It should be known that this subject has been thoroughly

investigated. Dr. Prime, for many years a journalist, made every case that was reported a matter of careful inquiry by addressing a letter to the place where the interment was reported to have occurred, and as an editor he read of many cases as usually reported with all the horrors naturally supposed to be associated with them.

His inquiries found not a particle of truth in a single case.

Our knowledge of the functions of the organs of our bodies will enable us to see how utterly false all these stories must be. If no signs of life can be discovered by the most careful examination of a body, is it not impossible that when shut up in a coffin made as close as it is and covered under six feet of earth, it should breathe again? How long would it be possible for a man in full health to breathe and live covered up in this way? Would any one who has studied the laws of respiration believe that a person believed to be dead could possibly revive in the grave? Let us, then, reject all these stories, and remove from the minds of those over whom we have influence this dread of premature burial.

There is another fear which seems to be widespread, affecting the cultivated as well as the ignorant, to many distressing—the fear of being eaten by worms after burial. This belief is not without interest to our profession, whose knowledge of the laws of life should enable them to decide as to a question of this kind, and in the department of natural history it is surely worthy of our investigation.

Sir Thomas Browne, like a wise physician, and in advance of the age in which he lived, more than two hundred years ago, thus wrote: "While we suppose common worms in graves 'tis not easy to find any there; few in churchyards above a foot deep; fewer or none in churches."—["Hydriotaphia," p. 322, Boston edition of "*Religio Medici*," etc. Roberts Brothers, 1878.]

It is singular that persons who have knowledge of animal life can for a moment entertain this belief. Those who work even very little in the earth know that neither worms nor any other creatures are found more than a few inches below the surface.

This belief became prevalent from the observation of worms

feeding on the bodies of animals when left unburied in the open air.

Much is due, doubtless, to the poets who have recorded their belief in their writings.

The translators of King James's version of the Scriptures believed it so firmly that they thought it necessary to make it the belief of Job also, who did not say a word in proof of it as it prevailed then and now (Job 19 : 26). A reference to this passage shows the use of italics by which the translators introduced their own belief and that of the age. The new version omits the word worms, and gives the translation thus : "And after my skin hath been thus destroyed."

The Rev. Robert J. Breckenridge, a prominent divine of the Presbyterian Church, was greatly interested in this subject, and during a long life sought for its truth, where it was likely to be found, among church sextons and superintendents of cemeteries—all who would be likely to have any knowledge on the subject. He never found the least evidence of the existence of worms in graves. He never learned that any of those persons favorably placed for making the discovery, had ever seen a worm of any kind in or on a body interred in a grave.

I know a very intelligent undertaker, who has followed his business for many years, with the best opportunities for learning the truth. During our late war he had the care of the remains of many soldiers which had been interred in the South, and which had been disinterred and sent home. He informed me that he had never seen a living creature of any kind feeding on these remains. He said the same in reference to his experience in a large cemetery and churchyards to which his business has called him during the many years of his service. I do not know any one who is more competent to make such observations or whose testimony could be received with more confidence.

But we are told Job has other references to worms (Job 17 : 14), "I have said to the worm, Thou art my mother and my sister." Then surely it will not eat us. The expressions are figurative as "The womb shall forget him ; the worm shall feed sweetly on him" (24 : 20). "My flesh is clothed with worms and clods of dust" (7 : 5).

“ They lie down alike in the dust, and the worm covereth them” (21 : 26). Evil and despised men and weak men are compared to worms. The writers so confess themselves (Ps. 22 : 6). “ But I am a worm.” One of the Herods was eaten up of worms and died (Acts 12 : 23). And some of his relatives richly merited the same termination of life.

We have a report from a correspondent of the *Therapeutic Gazette*, in Paris, of the recent discovery of insects on the bodies found in the Ivry Cemetery, Paris. (*Therapeutic Gazette*, March, 1888, p. 209). The writer describes four species of *Diptera*, one of the order *Coleoptera*, two of the order of *Thysanoura*.

There must be an error somewhere in the investigations made in the cemetery at Paris. If the eggs deposited by the blow-fly before interment, became maggots in the grave, this will not explain the statement that other creatures two years later reach a body enclosed in a coffin and buried several feet under ground. There must have been some condition different from that of interment with us, about which I shall inquire ; for after many years of inquiry it is strange that nothing as now reported has ever been observed. From Paris itself there is evidence against this recent statement. When the Cemetery of the Innocents was removed in that city in 1786-87, great masses of adipocere were found into which the bodies there interred had been changed. This, of course, could not have occurred if the animal substances had been destroyed by worms.

Such changes have been observed in this city, and elsewhere in this country.

The remedy which some will doubtless propose is cremation, for which all of our friends are not yet ready.

TEN YEARS OF CHOLERA IN CALCUTTA.

THE fortunes of the Calcutta municipality have on several accounts a more than local interest. In the first place, Calcutta is situated in the precise centre of the tract of country known in India as the “ endemic cholera area.” In this, from some unlucky conjuncture of favorable circumstances, the

conditions necessary for the propagation of cholera are always present. While in the rest of the country cholera is an intermittent visitor, in Calcutta and for a hundred miles around it in every direction cholera is perennially active, and from this starting-point the great epidemics which from time to time travel westward to the other provinces of India, to Persia, Egypt, and Europe, invariably commence their career of devastation. In the next place, Calcutta, as being conventionally the capital of the Empire and actually the residence for several months of the year of the Viceroy and his Council and of the local Governments, having a large educated population, an influential Bar, an active press, and a considerable European element, is foremost among Indian municipalities; we may here hope to see the system of local self-government working more efficiently and advantageously than in less advanced communities, and we are thus able to ascertain the highest level of usefulness which, under the general social conditions of India, it is capable of attaining. In the third place, Calcutta stands along among Indian cities in the fact that seventeen years ago it was furnished with the two main instruments of sanitation—namely, an efficient system of sewerage, and a supply of pure water. Both systems have been largely developed since their initiation in 1870, and Calcutta is now permeated in every quarter by sewers; and nine or ten millions of gallons of filtered water are supplied daily for the consumption of the inhabitants, besides several millions of gallons of unfiltered water for watering, flushing, and other like purposes. The effect of these great reforms on the public health is a question of the highest interest and importance, as every city in India, with the exception of Bombay, has still to deal with the evils which they are especially designed to counteract. Lastly, Calcutta is remarkable for the circumstance that in it alone among Indian municipalities the public health is watched, and the guardians of the public health are advised by a scientific European expert, practically familiar with sanitation as carried out, of late years, in the great cities of England. A year or two ago the Commissioners had the good sense to invite Dr. Simpson, then in charge of a great Scotch municipality, to go out to India as their Health Officer, and he has now recorded the impressions which his first year's

experience has left on his mind, and the results which, in his opinion, the history of cholera for the last decade in Calcutta is calculated to establish. Exceptional interest attaches to the conclusions arrived at by so competent an authority, studying Indian phenomena in the light of European experience, and without any of the local prejudices or prepossessions which beset every official hierarchy, and which, even when they do not influence the judgment of the scientific inquirer, not unjustly lead the critical public to receive his inferences with suspicion and incredulity.

The history of cholera in Calcutta has been remarkable, and, in one sense, disappointing. Contemporaneously with the introduction of pure water and efficient drainage, cholera mortality fell from an annual average ratio of eight per mille to an average ratio, for the next five years, of less than three per mille. At this point, however, the improvement stopped. The quinquennium 1876-80, notwithstanding a very favorable year in 1880, showed a higher average ratio, and in the quinquennium 1881-86 there was a still more marked intensity of cholera, the average ratio of mortality from that disease rising as high as 4.5 per mille. This result is surprising in the face of the generally-accepted view that no disease is more amenable than cholera to sanitary improvements. It might be explained by the influence of some favorable climatic condition ; but here we are met by the startling circumstance that two neighboring municipalities—the “Suburbs” of Calcutta and the town of Howrah—“did not suffer during the last quinquennium with proportionately the same intensity as Calcutta.” Both have a higher normal cholera mortality than Calcutta ; but, comparing the quinquennium 1870-74 with 1880-4, the increase has been more noticeable in Calcutta than in these places ; its relative superiority has thus diminished. The explanation of this Dr. Simpson considers to be that “the favoring climatic agencies, whatever they may be, found in Calcutta during the last six years some weak point or points which rendered the town more vulnerable to cholera prevalence than it had been since 1870, and which caused it, when compared with previous years, to approximate relatively to the death-rate of Howrah and the suburbs.” Moreover, the cholera mortality in Calcutta in several recent years, notably

1882 and 1884, was considerably higher than that of any year since 1869, an increase which has not been rivalled in either of the adjoining localities.

What, then, are the weak points to which this serious recrudescence must be attributed? In considering them Dr. Simpson ascertained that the increase has not been general, but has occurred year after year in certain clearly defined localities, while places in the immediate neighborhood have enjoyed complete immunity. Assuming, therefore, "that some meteorological conditions favorable to the promotion of cholera existed, and that for a series of years some peculiar combination of electrical, chemical, astronomical, telluric, cyclonic, and other agencies were present which were formerly absent," the explanation of their especial efficacy in certain spots had still to be sought. Some special local cause had been, it was evident, at work, as well as the general predisposing influence. These special causes were very easily discovered. In the first place, owing to an increased demand in other parts of the town, and imperfect arrangements for distribution, the water-supply to certain localities had of late years undergone serious deterioration. This drove the poorer inhabitants to resort either to water carried by the native water-carriers in receptacles of questionable cleanliness, or to the tanks and wells, the contents of which are often very little better than sewage. Impure water is invariably a powerful instrument both in preparing the classes who use it for the reception of epidemic disease and, in the case of cholera, for its actual conveyance from one victim to another; and the experience of Calcutta has supplied irresistible evidence of its efficacy in both these directions. That such a result should have been possible while ten million gallons per diem are available in Calcutta for a population of less than half a million is a striking instance of the mismanagement of which Indian municipal bodies are capable when they are left without definite official superintendence and control. The Government will, we presume, at once interfere to insist peremptorily on proper distribution of the water, and such addition to the supply and economy in its use as will secure a sufficiency for drinking purposes to every class of the population.

Another "weak point" which the Health Officer brought

to light was the impure condition into which many of the sewers had been allowed to lapse. All sanitarians are agreed as to the imperative necessity of vigilant precautions for the cleansing and ventilation of sewers. These precautions are, the Health Officer points out, still more essential in India than they are in Europe ; but in Calcutta they appear to have been, to a very large extent, neglected, and the sewers have thus become, in many parts of the city, "a fruitful source of disease." The third weak point on which the Health Officer insists is that "the present conservancy and nuisance arrangements allowed by the Commissioners are altogether inefficient for a city of the size of Calcutta, and totally inadequate to cope with the ordinary requirement of filth removal. To one accustomed to the cleanliness of a European town the filth found in all but the principal streets is simply appalling." On this point it appears that the municipality has preferred to follow its own traditions rather than the advice of its Health Officer. For years the same complaint has been uttered by every authority who has had to deal with Calcutta sanitation, and in every instance the result has been that the warnings of science have been silenced by ignorance, indifference, or short-sighted economy. The result is that Calcutta remains the focus of cholera prevalence, and that, so far as the statistics of the two last decades show, the epidemic has a very marked tendency toward intensified prevalence. Since 1881 more than 24,000 lives have been sacrificed in Calcutta and its suburbs to this single cause, and the facts urged by the Health Officer give little to hope that, as matters now stand, any permanent improvement will be effected. The causes of the evil are perfectly understood. They have been for many years past insisted upon by local and supreme Governments in India and the Army Sanitary Commission in this country. The latter body, in their last Memorandum, dwell with grave disapproval on the refusal of the municipality to comply with the requisition of the Supreme Government that it should fully utilize its powers of taxation till the well-ascertained causes of disease had been removed ; and they urge the Commissioners to remember that public opinion will not allow the Government of India to go on much longer leaving the sanitary condition of every city in the deplorable condition which now prevails, and

that they may be compelled by superior authority to fulfil their duties to their fellow-citizens.

We have dwelt at length on the course of cholera in Calcutta, because it forms a characteristic item, though a small one, in the general sanitary question in India. The Army Sanitary Commission in its recently-published Memorandum has drawn a really appalling description of the condition of the country as regards the public health, of the vast devastation effected by the epidemics which sweep across a defenceless population, and the total inadequacy of the present arrangements to meet the necessities of the case. Something, they say, has been effected in municipalities ; but these contain only one and a half million of inhabitants. But the country at large is practically untouched. "It is impossible," say the Commissioners, "to escape the conclusion that the vast civil population is decimated by epidemics simply because nothing effectual has been done to root out their causes." They urge that the work to be done is very great, that its difficulty increases with every year, and that "we now know by ample experience that it cannot be done by present methods." They refer to the "altogether deplorable record" of thirty-eight millions of deaths, which during the last decade have been occasioned in India by "diseases which belong to the mitigable or preventible order," which in other countries have been either altogether eliminated or reduced to insignificant proportions ; and they point out that the registered mortality from fever represents, on the well-recognized proportion of disease to death, "in fever attacks several times over the entire population of India, and all the loss of working power which fever attacks entail." Statements such as these, emanating not from a body of sentimentalists or fanatics, but from a body of experienced officials and men of science, cannot be officially ignored. With respect to cholera, as Sir Douglas Galton pointed out recently at the Society of Arts, the unchecked prevalence of that disease in India places the English Government in the embarrassing and illogical position of having secured immunity at home by sanitary precautions, while India continues the headquarters and starting-point of epidemics which threaten the rest of the world. The troublesome question of quarantine will fall to the ground when Indian

ports cease to be centres of infection. The attention directed to the subject at the recent Hygienic Congress at Vienna is likely to be productive of results. The Government of India is said to be contemplating a general move forward all along the line ; and, for the credit of the Indian Administration, no less than the well-being of Indian communities, it is to be hoped that the projected changes will be thorough, courageous, and effectual. At present, one of the great functions of governments would appear in India to remain unattempted. —*The Saturday Review*, July 28th, 1888.

THE MEDALS, JETONS, AND TOKENS ILLUSTRATIVE OF SANITATION.

By Dr. HORATIO R. STORER, Newport, R. I., Member of American Public Health Association, etc.

IX. *Famine.* Continued from page 58.

D. FRANCE.

:(a) *Artois.*

467. Obverse. Three empty ears of grain beneath the arms of Artois ; at each side, 15—87. Legend : Reddit · Ager · Sterilis · Tristes .

Reverse. Five full ears of grain ; above, the sun and moon. Legend : Sed · Laetvs · Egenos · Beneath, 1588.

Van Loon, i., p. 372 ; P. and R., p. 21, No. 27.

The following, though executed in Bavaria, is to be included among French tokens of Famine.

468. Obverse. A winged globe, anchor and olive branch. Above, " 1771." Inscription : Le Pain Petit, 1772 : Le Grenier Vvide—Le Paisan Triomfe, Le Bourgeois Timide *

Reverse. 1772 | L'Abondance— | Enfermé ! Ce N'Est | Point Fortune— | Mais Dieu Nous Cha- | tie Par L'Usure, | Pour Nos Crimes · Exergue : Ioh : Chr : Reich · Fe | In Fürth · | Dantes . Tin.

P. and R., p. 50, No. 150.

(b) *Paris.*

469. A female giving bread to a mother and her two children. Legend : Fames Pietate Principis (Louis XIV.) Sublata · Exergue : M·DC·LXII· Foran has Sublevata.

P. and R., p. 183, No. 49 a.

Foran. Medals of the Reign of Louis XIV. *Canadian Antiquarian and Numismatic Journal*, October, 1882, p. 73, No. lxxi.

470. II. Livres De Viande.

This is in my collection. It was unknown to P. and R.

The following interesting jetons were struck during the recent Siege of Paris in the Franco-German War. They were all unknown to P. and R.

471. Obverse. Prix Des Aliments Pendant Le Siège De Paris, Notes Directes Prises Aux Halles Centrales par l'éditeur F. T.

Reverse. The price of a goose.

Frossard thirty-sixth sale, 15th-16th May, 1864, No. 779.

472. Do. Le 19 Janvier 1871 Le Pain Est Rationné A 300 Gr. Par Personne, (etc.)

Van Peteghem Cat., 1874, No. 940.

473. Do. Le 20 Janvier Les Boucheries Canines Sont Per-
mises, (etc.)

Ibid., No. 941.

474. Do. Plus De 50 Étaux Sont Fournis De Viande De
Chien, (etc.)

Ibid., No. 942.

475. Do. Price of dogs, cats, etc.

Ibid., No. 943.

476. Do. Price of rabbits.

Ibid., No. 944.

477. Do. Do. of turkeys.

Ibid., No. 945.

478. Do. Do. of chickens.

Ibid., No. 946.

479. Do. Do. of fish.

Ibid., No. 947.

480. Do. Do. of eggs.

Ibid., No. 948.

481. Do. Do. of potatoes.

Ibid., No. 949.

482. Do. Do. of cabbages.

Ibid., No. 950.

483. Do. Do. of onions.

Ibid., No. 951.

484. Subsistances Populaires IX^e Arrond (issement). Huile.
Ibid., No. 952.

485. As above, but Vin.
Ibid., No. 953.

A French token issued at New Orleans, in the United States, will be mentioned hereafter, No. 654.

E. GERMANY.

486. Obverse. Bust of Christ to right. On shoulder, C. W. (C. Wermuth, of Gotha.) Legend: Alpha Et Omega.

Reverse. Inscr. in German script: O | Jesu | hilff der | Christenheit | behült | vor Krieg, Pest, Theurer Zeit. | 1694. Upon rim, Vere Semper In Evm Spero. Silver.

P. and R., p. 32, No. 73.

487-502. During the famines of 1771-73 there were a large number of German general pieces issued, bearing quotations from Scripture and legends inculcating resignation to the will of God, and enumerating the extremely exorbitant prices at which the ordinary articles of food were sold. Many of these bore reference also to the similarly severe preceding famine of 1694. An extensive series of them are known as the "Kornjuden" medals, and have the general device of a Jew with a sack of wheat upon his back, of which the devil tears a corner, so that the grain escapes; in others the Jew is hanging from a tree. Others still, represent Joseph and his brethren. Though I have prepared descriptions of them all, I will not enumerate them in detail, as it would delay us too long from other sections of our subject. They will be found carefully given by Pfeiffer and Ruland.

P. and R., pp. 33, 34, Nos. 74-79: *Ibid.*, pp. 46-47, Nos. 127-37. Of these, No. 487 is in the Lee Collection, and Nos. 488 and 500 in my own. Nos. 488 and 491 are figured by P. and R.

502-24. Other general pieces are the following, of which No. 512 has already been described, under France; No. 468.

Ibid., pp. 45-6; Nos. 124-5-6; pp. 48-53, Nos. 143-162; Nos. 143 and 155 are figured.

In these and subsequent famines, medals and tokens were also struck by separate German cities.

(a) *Altenburg* (1771-2).

525. P. and R., p. 42, No. 111.

The following, which is in my collection, was unknown to P. and R.

526. Obverse. A quadrangular pyramid, bearing an oval shield, set upon a four-sided pedestal. Inscription: Grose Theurung.—Schlechte Nahrung Upon field, divided by the pyramid, Alten-burgs | Denk-mal | 1771-1772 | gest-orben | 300-708

Reverse. die | Altenburgis(ch): | Theurung | 1. Sch: Weize 20 Th: | 1. Sch: Korn: 19 Th: | 1. Sch: Gerste: 16 Th: | 1. Sch: Haber. 7 Th: | 1 lb. Brod 20 P. Tin. It differs in important respects from the preceding, and fixes the mortality at ten times greater than that.

(b) *Arnstadt* (1816-17).

527. *Ibid.*, p. 58, No. 174.

See also under Erfurt (1846-47), No. 545.

(c) *Baden* (1817).

528. *Ibid.*, p. 58, No. 175.

(d) *Barmen* (1846-47).

529. *Ibid.*, p. 66, No. 209.

530. Uniface. Obverse as above, save there are crosses instead of stars. Tin.

Neumann, No. 31,583. This was unknown to P. and R.

(e) *Bonn* (1771).

531. P. and R., pp. 41, 183, No. 103.

(f) *Breslau* (1645-1717).

532. *Ibid.*, p. 24, No. 45; Neumann, No. 4830.

533. P. and R., p. 24, No. 46; Neumann, No. 4831. This is in my collection.

534-5. P. and R., pp. 24-25, Nos. 47-8.

(g) *Coburg* (1816-17).

536. *Ibid.*, p. 60, No. 182.

(h) *Cologne* (1789).

537. *Ibid.*, p. 41, No. 104. Gold, silver and copper.

This is in the collection of Mr. Robert Shiells, of Neenah, Wisconsin.

538. *Ibid.*, p. 41, No. 105.

(i) *Elberfeld* (1816-17 and 1846-47).

539. P. and R. omit the date upon reverse, and that it exists in gold as well as silver and copper was unknown to them.

Ibid., p. 58, No. 176; Neumann, No. 6099; Norblin Cat., 1855, No. 2945.

This is in my collection.

540. P. and R., p. 66, No. 210.

541. *Ibid.*, p. 66, No. 211.

This is in the Lee Collection and my own.

(j) *Erfurt* (1816-17 and 1846-47).

542-43. *Ibid.*, pp. 58-59, Nos. 177-78.

544-45. *Ibid.*, p. 67, Nos. 212-13.

(k) *Franconia* (1779).

546. Obverse. A hand stretched forth from the clouds, pouring rain over the land from a cornucopia. Legend: Der Segen des Herren Macht Reich Ohne Myhe (The blessing of the Lord makes rich without trouble).

Reverse. A sheaf of wheat. Legend: Auf die gesegnete getrayd ernde in Franken. 1779.

Snowden. Medallie Memorials of Washington in U. S. Mint (Misc. medals), p. 135, No. 14.

This was unknown to P. and R. It is in the U. S. Mint Collection at Philadelphia.

(l) *Fulda* (1816-17).

547. P. and R., p. 59, No. 179.

(m) *Furth* (1772).

548-51. Neumann, No. 32,637-8-9-40.

These were all unknown to P. and R.

(n) *Gotha* (1816-17 and 1847).

552. P. and R., p. 59, No. 180.

553. *Ibid.*, p. 67, No. 214.

(o) *Halle* (1846-47).

554. P. and R. omit upon obverse L. Haase Fundator and in its exergue Zum Besten Unserer | Armen.

Ibid., p. 67, No. 215.

This is in the collection of the Newport (R. I.) Historical Society.

(p) *Hamburg* (1713).

555. This is attributed by P. and R. to 1713, though the only date upon the medal is 1711.

Gädechens, No. 1723; P. and R., p. 36, No. 85.

(q) *Hückeswagen*.

556. *Ibid.*, p. 59, No. 181.

(r) *Munich* (1771 and 1817).

557-58. Neumann, Nos. 6190-91; P. and R., p. 41, Nos. 106-7.

559-61. *Ibid.*, p. 60, Nos. 183-4-5; Neumann, Nos. 6324-5-6-7-8.

562-66. P. and R., p. 61, Nos. 186-7-8-9-90.

(s) *Nuremberg* (1538-40, 166-, and 1773).

567-69. *Ibid.*, p. 15, Nos. 3, 4-5. P. and R. apparently erroneously class the former of these as issued in 1528.

570. *Ibid.*, p. 25, No. 50.

571-72. *Ibid.*, p. 55, Nos. 163, 164; fig. of 164.

The latter of these I have, in silver.

(t) *Regensburg* (1741-44).

573. *Ibid.*, p. 39, No. 98.

(u) *Saxony* (1720, 1771-73, 1805-6, and 1846-47).

574. *Ibid.*, p. 37, No. 89.

575. *Ibid.*, p. 42, No. 112, fig.

576. There is a variety of this in both the Lee Collection and my own, which was unknown to P. and R. In this the word Denkmahl upon the obverse is divided as in their figure, though they do not mention the fact, and upon the reverse, instead of 1 Pfd: Butter there is 1 lb., and instead of there being minute crosses all the points are simple dots.

577. I have another variety still in which, while the reading is the same, the dies are in many minor respects different. It also was unknown to P. and R.

578-80. *Ibid.*, p. 43, Nos. 113-14-15.

I have the last of these, unless indeed it prove a different variety unknown to P. and R., who give Brod upon the reverse, while in my specimen it is Brodt.

581-86. *Ibid.*, p. 43, Nos. 116-17-18-19-20; p. 44, No. 123.

The last but two of these is in the Lee Collection.

587-91. *Ibid.*, pp. 48-9, Nos. 138-9-40-1-2.

592-93. *Ibid.*, p. 57, Nos. 172-73.

594. *Ibid.*, p. 68, No. 216.

(v) *Siebenbürgen* (1602).

595-99. *Ibid.*, p. 22, Nos. 34-5-6-7-8.

(w) *Silesia* (1694, 1772, and 1847).

See under the "Kornjuden" medals, Nos. 487-502.

600. *Ibid.*, p. 68, No. 217.

(x) *Weimar* (1771-72, and 1816-17).

601-2. *Ibid.*, p. 41, Nos. 108-9.

603. *Ibid.*, p. 61, No. 191.

(y) *Westphalia* (1847).

604. *Ibid.*, p. 68, No. 218.

(z) *Wettenhausen* (1771).

605. *Ibid.*, p. 42, No. 110.

(aa) *Wurtemberg* (1816-17).

606-23. *Ibid.*, p. 62, Nos. 192-3-4-5'-6-7-8-9-200-1-1'-2-3-4-5-6-7; No. 194 is figured. Of these, No. 621 is in my collection.

624. In the Lee Collection and my own there is a variety of No. 610, unknown to P. and R., where, instead of 1 lb., there is 1. PF.

F. BOHEMIA.

(a) *Reichenberg* (1805).

625. *Ibid.*, p. 56, No. 171.

G. ENGLAND.

These were almost all during the reign of Geo. III., and were all unknown to P. and R.

626-28. Neumann, Nos. 25,635-6-7.

The latter of these is in the Lee Collection.

The following are mules.

629. Obv. the rev. of N. 25,632, and rev. the rev. of N. 25,633. This is in the Lee Collection.

630. The same obverse, and rev. the rev. of N. 25,637. Also in the Lee Collection.

631. The same obverse, and rev. the rev. of N. 25,634 (Duke of Beaufort, etc.). Also in the Lee Collection.

632. Obverse the rev. of N. 25,637, and rev. as that of the last. Also in the Lee collection.

The following are of 1796 :

633-44. Neumann, Nos. 25,349-51-52-53, 25,579-80, 25,632-3-4-5-6-7. See also N. 22,814-5, 24,289.

Nos. 637 and 639 are in the Lee Collection.

645. Obverse. Bust of Geo. III., to right.

Reverse. A ship. Inscr.: Corn Imported by Government, 1796.

Frossard 37th Sale, Oct. 2d-3d, 1884, No. 15.

646. Obverse as above.

Reverse. A sheaf of wheat. Legend : Relief against Monopoly.

Ibid., No. 16.

(a) *Badminton, Gloucestershire* (1795).

647-48. Neumann, No. 22,814-15 (Duke of Beaufort, etc.).

The former of these is in my collection.

(b) *London.*

649. North East Nourishment Society.

H. P. Smith Cat., 16th-17th March, 1883.

650. "If thine enemy be hungry," etc. Allegorical.

In my own collection.

H. BRITISH INDIA.

651. 1874. Upon reverse : Grain Token. One Rupee, upon a band.

Brass, with large round opening in centre. It is very rare.

Coin Collectors' Journal, ix., 1884, p. 186.

This was unknown to P. and R., although they mention this famine of 1874, and that the English Government expended for its relief no less than six million pounds sterling (Loc. cit., p. 27).

I. CANADA.

There is hardly a British American piece of any kind that can be called a famine token in the same sense as the foreign ones that have been enumerated. The nearest approach to it is perhaps the following :

652. Obverse. A farm laborer, to the right, threshing grain with a flail. Legend : No—Labour | No Bread

Reverse. A man ploughing with two oxen tandem, to left.
Inscription : Speed The Plough | Halfpenny Token.

Copper. 26 mill. 17.

Neumann, No. 25,391 ; Fonrobert Cat. (Nord-Amerika), No. 17 ; McLachlan, *Am. Journ. of Numismatics*, Jan., 1880, p. 72 ; *Ibid.*, Canadian Numismatics, Montreal, 1886, p. 9, No. xxviii. ; Leroux, Atlas numismatique du Canada, Montreal, 1883, p. 35, No. 228, fig.

This is in my collection. Neumann includes it among English tokens of whose origin and locality he is ignorant (Tokens ohne Bezeichnung des Ortes), but McLachlan recognizes it as "undoubtedly Canadian," as do also Weyl in the Fonrobert Catalogue, and Leroux. McLachlan places it among the tokens of Montreal. It was unknown to P. and R.

653. There is a variety, with a difference of position of the flail toward the lettering.

McLachlan, Canadian Numismatics, p. 9, No. xxix.

They were both struck at about 1837, during the prevalence of the "hard times" upon the other side of the border.

I. THE UNITED STATES.

I have said in a previous Section, VIII., Diet, that the tokens of dealers in provisions of whatever kind were with us but simply business advertisements or traffic checks, and would therefore not be admitted here. Exception will only be made in the case of the following token of Daguin Frères of New Orleans.

654. Obverse. Inscription : Bon | Pour Un | Pain.

Reverse. The same, in English.

Woodward sixty-seventh (Levick) sale, May, 1884, No. 2175, fig. of obverse. This is extremely rare. At the sale referred to it brought \$7.70.

The preceding tokens and medals have been those commemorative of the scarcity and dearness of provisions and failure of harvest. There are still others of famine, and consequently of deaths by starvation and zymotics, whereon the cause of the national distress is more distinctly specified. They are of several types.

α. Destruction of harvest by excessive Cold.

(a) *Hamburg* (1740).

655. P. and R., p. 38, No. 95.

656. *Ibid.*, p. 183, No. 95^a.

(b) *Holland* (1698).

657. *Ibid.*, p. 36, Nos. 80-1-2. Of these, the two latter have been already mentioned, and are our Nos. 454 and 455.

(c) *Silesia* (1740).

658. *Ibid.*, p. 38, No. 94.

β. Destruction by Hail.

(a) *Silesia* (1593 and 1693).

659. *Ibid.*, p. 30, No. 69.

γ Destruction by Floods.

(a) *Europe generally* (1595, 1771, and 1784).

660-63. *Ibid.*, p. 22, No. 31 ; p. 45, No. 125 ; p. 56, Nos. 167-8-9. Of these, No. 125 has been already referred to. It is our No. 523.

(b) *Dresden* (1845).

664. *Ibid.*, p. 66, No. 208.

(c) *Hamburg* (1685, 1717-18, and 1756).

665. *Ibid.*, p. 29, No. 62.

666-68. *Ibid.*, pp. 36, 37, Nos. 86-7-8.

669. *Ibid.*, p. 40, No. 101.

(d) *Holland* (1741 and 1775-6).

670. *Ibid.*, p. 39, No. 96.

671. *Ibid.*, p. 55, No. 165. P. and R. wrongly omit the second A in Waateren.

This, in silver, is in my collection.

The preceding was of the inundations of 14th-15th Nov., 1775. There is another, of those of 20th-21st Nov., 1776, which was unknown to P. and R., and I therefore give its description.

672. Obverse. A column, with trophy and scroll. Against it leans a female, who looks imploringly toward heaven, whence opens the sun. On her arm the palm of martyrdom and beneath her feet a struggling bird (or harpy?). Beside her, a dog watches the approach of the sea. Legend : *Lvx Verita-*

tis—Nobis—Addat Robvr | Pax Diebvs Nostris. I. M. Lageman.

Reverse. A town in background, and in foreground a bale with two barrels. Between, a raging sea, with wrecks. Upon a rock, at left, Op Den | 20 & 21 | Nov : | 1776. Legend : Ter Gehengenis Der Storm w : | En Watervloed.

Van Loon, 513; Völcker Cat., Amsterdam, April, 1888, No. 1685.

This is in my collection, in silver.

673–675. There are also pieces commemorating inundations and consequent distress for want of food in Zealand in 1552 (Van Mieris, iii., 304, 2 and 308), in 1570 (Van Loon, i., 135), and on 24th Dec., 1593 (*Ibid.*, i., 442), which are not mentioned by P. and R., possibly because the devastation was confined to a limited extent of country.

(e) *Königsberg* (1801).

676. P. and R., p. 56, No. 170.

(f) *Nuremberg* (1784).

677. *Ibid.*, p. 55, No. 166.

(g) *Saxony* (1772).

Ibid., p. 48, No. 140. This has been previously referred to. It is our No. 589.

(h) *Silesia* (1736–37 and 1854).

678–681. *Ibid.*, p. 37, Nos. 90–1–2–3.

Of these, the first is in my collection, in silver.

682. *Ibid.*, p. 71, No. 219.

(i) *Wallachia* (1597).

683. *Ibid.*, p. 22, No. 32.

δ. Destruction by Lightning.

See No. 659.

ε. Destruction by Drought.

684. *Ibid.*, p. 40, No. 99.

ζ. Destruction by Wind.

See the preceding medal, and also No. 671.

η. Destruction by Locusts.

685-690. 1693. *Ibid.*, pp. 29-30, Nos. 66-7-8, 70-1-2. Nos. 66 and 70 are figured.

691. 1748. *Ibid.*, p. 40, No. 100.

This is in my collection, in silver.

θ. Destruction by Field Mice.

692. 1772-74. *Ibid.*, p. 44, No. 121.

This is in the Lee collection.

693. Obverse. An arm from clouds strikes with a bundle of rods a leafless tree. Inscription in German script : Gottes Hand Schlägt das Land. Exergue : 1773.

Reverse. A field of grain, with nine mice feeding in the foreground. Inscription : 72 . Klein Brod . 73 . Mäuse Noth . Exergue : in Sachsen | 1773.

Unknown to P. and R. It is in my collection. In some respects it resembles the last ; in others it is very different.

694. *Ibid.*, p. 44, No. 122.

z. Destruction of harvest by Earthquake.

695. Among ancient medals there is one of Vespasian, commemorating the destruction in this manner of Paphos in Cyprus.

Vaillant, *Numismata Imperatorum Romanorum*, 1696, p. 98.

696. The earthquake at Lisbon is commemorated in similar manner by at least one, if not indeed by two distinct medals.

Woodward sixty-ninth (private) sale, No. 1473.

Frossard sale, 21st-22d Oct., 1883, No. 1488.

κ. Destruction through terror at comets, preventing agriculture and its consequent harvest.

Many of these pieces are described at length by P. and R. Since, however, Mr. David M. Walter, a learned lawyer of New York, is about publishing a monograph upon the subject, I will not anticipate his results. As an instance, however, of the great interest of the comet medals, many of which also commemorate the death of illustrious men, I will mention a recent monograph upon the Sidus Julium (the comet of Julius Cæsar), by Alphonse De Schodt, in *Revue belge de Numismatique*, July, 1887, pp. 329-405.

In the next Section, X., I shall consider the medals of Epidemics.

(To be continued.)

THE NEW NATIONAL QUARANTINE LAW.

AN ACT TO PERFECT THE QUARANTINE SERVICE OF THE UNITED STATES.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That whenever any person shall trespass upon the grounds belonging to any quarantine reservation, or whenever any person, master, pilot, or owner of a vessel entering any port of the United States, shall so enter in violation of section one of the act entitled "An act to prevent the introduction of contagious or infectious diseases into the United States," approved April twenty-ninth, eighteen hundred and seventy-eight, or in violation of the quarantine regulations framed under said act, such person, trespassing, or such master, pilot, or other person in command of a vessel, shall, upon conviction thereof, pay a fine of not more than three hundred dollars, or be sentenced to imprisonment for a period of not more than thirty days, or shall be punished by both fine and imprisonment, at the discretion of the court. And it shall be the duty of the United States attorney in the district where the misdemeanor shall have been committed to take immediate cognizance of the offence, upon report made to him by any medical officer of the Marine-Hospital Service, or by any officer of the customs service, or by any State officer acting under authority of section five of said act.

SEC. 2. That as soon after the passage of this act as practicable, the Secretary of the Treasury shall cause to be established, in addition to the quarantine established by the act approved March fifth, eighteen hundred and eighty-eight, quarantine stations, as follows: One at the mouth of the Delaware Bay; one near Cape Charles, at the entrance of the Chesapeake Bay; one on the Georgia coast; one at or near Key West; one in San Diego Harbor; one in San Francisco Harbor; and one at or near Port Townsend, at the entrance to Puget Sound; and the said quarantine stations when so

established shall be conducted by the Marine-Hospital Service under regulations framed in accordance with the act of April twenty-ninth, eighteen hundred and seventy-eight.

SEC. 3. That there are appropriated for the purposes of this act the following sums, out of any money in the Treasury not otherwise appropriated, for the construction, equipment, and necessary expenses of maintaining the same for the fiscal year ending June thirtieth, eighteen hundred and eighty-nine :

For the Delaware Breakwater quarantine : Construction of disinfecting machinery, steam-tug, warehouse, officers' quarters, and expenses of maintenance for the fiscal year eighteen hundred and eighty-nine, seventy-five thousand dollars.

For the quarantine station near Cape Charles, Va. : For the purchase of site, construction of wharf, repair of present hospital buildings and officers' quarters, disinfecting machinery, steam-tug, expenses of maintenance for the year eighteen hundred and eighty-nine, one hundred and twelve thousand dollars.

For the South Atlantic Station (Sapelo Sound) : Construction of disinfecting machinery, warehouse, wharf, small boats, and expenses of maintenance for the year eighteen hundred and eighty-nine, thirty-eight thousand five hundred dollars.

For the quarantine near Key West : Purchase of site, construction of disinfecting machinery, warehouse, small boats, steam-tug, hospital buildings and officers' quarters, expenses of maintenance for the year eighteen hundred and eighty-nine, eighty-eight thousand dollars.

For the Gulf quarantine (formerly Ship Island), provided for by the act of March fifth, eighteen hundred and eighty-eight, in addition to the amount appropriated by the act approved March fifth, eighteen hundred and eighty-eight : For the expenses for the year ending June thirtieth, eighteen hundred and eighty-nine, fifteen thousand dollars.

Quarantine station, San Diego Harbor, California : For the purchase of site and the construction of disinfecting machinery, warehouse, small boats, hospital buildings, officers' quarters, and for expenses of maintenance for eighteen hundred and eighty-nine, fifty-five thousand five hundred dollars.

For the quarantine station at San Francisco, Cal. : Hospital buildings and officers' quarters, disinfecting machin-

ery, warehouse and wharf, steam-tug, small boats, expenses for the fiscal year eighteen hundred and eighty-nine, one hundred and three thousand dollars.

For the quarantine station at Port Townsend: For the purchase of site, construction of disinfecting machinery, warehouse, small boats, hospital buildings, and officers' quarters, for expenses of maintenance for the fiscal year eighteen hundred and eighty-nine, fifty-five thousand five hundred dollars.

Approved August 2d, 1888.

EDITORIAL NOTES AND COMMENTS.

ATTENTION is particularly invited to our CHANGE OF ADDRESS. *All* correspondence and exchanges and all publications should be addressed:

113A Second Place, Brooklyn, N. Y.

SUBSCRIPTIONS ARE NECESSARY.—An exchange relates this parable: "A revivalist requested all in the congregation who paid their debts to rise. The rising was general. After they had taken their seats a call was made for those who did not pay their debts, when one solitary man arose, and explained that he was an editor and could not pay because all the rest of the congregation were owing him their subscription to his paper."

DIETETIC MANAGEMENT OF THE SUMMER DIARRHŒA OF INFANTS.—In a recent paper on this subject before the New York Academy of Medicine, Dr. A. V. Meigs, of Philadelphia, said in substance:

The best food for infants, after mothers' milk, is cows' milk, and the question of artificial feeding in health and disease hinges largely on its method of use. . . .

The milk should be absolutely untainted when used. By clinical experience he had found that cows' milk, to which had been added cream, sugar, and lime-water, gave good results; and when, by chemical analysis, he had found that such a mixture contains the same constituents in almost exactly the same proportions as human milk, he had become entirely convinced of the value of this food. He takes one

quart of cows' milk, puts it into a tall, narrow pitcher ; after letting it stand three hours, the upper pint is poured off. This contains the greater part of the cream. When the child is to be fed, he mixes together two ounces of this, three of lime-water, and three of sugar-water. If the infant is quite young, only two to four ounces will be needed at each feeding, and only that much should be prepared. . . .

While he regards this as in most cases the best food, he varies it in many ways to meet the needs of different cases. Of the four things to make cows' milk suitable for children with diarrhœa—addition of sugar, cream, and lime-water—the least essential, probably, is the use of milk-sugar. Occasionally it becomes advisable to use cane-sugar in diarrhœa. The addition of some starchy material, he said, is of great advantage in many cases. One of the best is arrowroot ; and the old method of boiling flour in a sack is excellent. . . . If the case is critical, collapse threatening, stimulants will be more to the purpose. A teaspoonful of brandy might be put into a glass of drinking water, or the child might receive thirty drops in sweetened water every two hours. One should not change the food too soon, because the child fails to grow better immediately.

LIQUID AND POWDERED BEEF PEPTONOIDS are recommended by many physicians of high repute as most acceptable and nutritious foods in cases of extreme debility from any cause. They are composed of beef, milk, and gluten.

“WHOLE WHEAT,” FURMENTY AND HOMINY.—Dr. Ephraim Cutter, of New York, contributed a paper not long ago to the *Albany Medical Annals* on “Cleaned Whole Wheat as a Diet,” which recalls pleasant memories of our boyhood days, when and where boiled whole wheat, when it was new especially, was a common repast under the name of *furmenty*. Moreover, *great hominy* and *lye hominy*, two preparations of whole Indian corn, in the same land of “hog and hominy” as *furmenty*, were ordinary dishes all the year round, particularly in Virginia, and, like *furmenty*, more or less common throughout the wheat and Indian corn regions of the Southern States, though, so far as we are informed, never common or improved upon elsewhere.

The preparation and cooking of great hominy for the family of which the writer was a member consisted in boiling whole Indian corn, first well washed, about a peck at a time, in six to eight gallons of water, with a handful of salt, put over cold, *all day*; that is to say, from breakfast time till night—eight to ten hours—until it was perfectly tender; frequently stirring the while, and adding boiling hot water occasionally to make up for the loss by evaporation.

It was all the better for keeping a few days, and therefore rarely partaken of on the same day it was cooked. Such a batch usually lasted a week. It was commonly eaten for breakfast with milk or butter, cold or warmed, as preferred.

Lye hominy was prepared by first soaking the whole Indian corn in the lye of wood ashes during the preceding night, and then washing and rubbing it in cold water, with the effect of getting the bran off. It was then put over in cold water, salted in about the same proportions as great hominy, and cooked in the same manner, not requiring quite so much time, however, as great hominy, on account of the previous soaking. The lye gives it a peculiar though pleasant taste; the corn, being wholly divested of bran, is more delicate as well as more savory than great hominy. And it is among the most digestible as well as most nutritious of foods.

Furmenty was also prepared and cooked on an equally large scale, and in about the same proportions of wheat and water, salted to the taste, as hominy. But if desired in small quantity for a single meal, Dr. Cutter's description of the cooking of whole wheat answers equally well for either: "For four adults, take one cupful of wheat (or corn), wash it clean in cold water; put it in a tin pail or crockery bowl or other suitable utensil, and add one half a teaspoonful of salt and three cups of cold water. . . . Boil for eight or ten hours . . . in a double water-jacket boiler, or in a 'Chamberlain' or other steam cooker."

But this, too, like hominy (and oatmeal, also, by the way), is all the better for being kept over for a few days, and should, therefore, be cooked in larger quantity at a time for even four persons.

SUPPRESSION OF QUACK MEDICINES.—Kultusminister von Gossler is reported to have recently announced his intention of

securing the co-operation of the Imperial Government in suppressing all advertisements of secret remedies throughout Germany.

BERLIN SEWAGE DISPOSAL.—Mr. Town-Councillor Margraff, Chairman of the Sewerage and Sewage Disposal Committee of the Berlin Municipality, has recently written to Mr. Charles Hancock, F.S.S., of the Middle Temple, London, expressing the utmost satisfaction with the sewerage of the town and the irrigation system adopted about fifteen years ago. "The Berlin Sewerage Farms," he writes, "are now beginning to yield a better revenue—even to the extent of giving a profit of two per cent on the outlay—which I hold to be a very favorable result, considering the very extensive costs we have been put to in the preparation of the land, its levelling, draining, etc. We hope in the future for further favorable and even better successes, and we do not by any means think of giving up our system or adopting any other. I maintain that our method is the best—nay, for a large town, the only possible one. Deodorization, chemical processes, precipitation schemes, are one and all—when tried on a large scale—hardly capable of being carried out with effect, and are very expensive, too; while as to the resultant sludge, not only is it impossible to make advantageous use of the same, but the mere getting rid of it is a most difficult matter."

THE BUFFALO INTERNATIONAL FAIR AND EXPOSITION, September 4th to 14th, promises to be one of the greatest public enterprises ever undertaken in America, and, perhaps, the greatest in the world, except the expositions that have been directly supported by national governments. The exposition will doubtless add fame to Buffalo, already celebrated for her enterprise and for the public spirit of her citizens. Many of the fivescore of business men who projected this exposition, and to whom Buffalo is indebted for this great fair, have national reputations for public and private enterprise, and all are representative citizens of Buffalo and Western New York.

THE MISSISSIPPI VALLEY MEDICAL ASSOCIATION meets at St. Louis, September 11th–13th. The programme thus far arranged includes many papers and discussions of importance.

Arrangements for special rates are being made, and the society extends a cordial invitation to all members of the profession.

CHICAGO, ILL.

J. LUCIUS GRAY, M.D., *Secretary*.

THE PROGRESS OF DISEASES AND MORTALITY RATES AT THE
MOST RECENT DATES, BASED UPON OFFICIAL AND OTHER
AUTHENTIC REPORTS.

YELLOW-FEVER.—No one who paid any regard to our remarks on the introduction and future probabilities of yellow-fever into Florida, in our January number last, has any need for surprise at the recent recurrence and spread of the disease into contiguous places. They were based upon a considerable knowledge of the disease, and the futility of such measures as were then practised for its prevention. The present outbreak appeared to us to be scarcely less certain at that time than at the present ; and that those in authority to deal with the disease should continue to waste time and lives, in the face of patent knowledge of the futility of the measures that appear to have been instituted thus far for protecting the lives of the people and stamping out the disease, is, to us, wholly incomprehensible. Surely there can be no well-read physician in the United States, whether he has ever personally encountered yellow-fever or not, who has not learned enough of the disease to know that the *only safety of persons who have not had the disease is flight from an infected place*. And need it be added : the only effectual method of those in authority is to act upon this knowledge by providing places of refuge and *requiring* every vulnerable subject to leave the infected place and *things* to be promptly disinfected. The means we have no need to dilate upon. The arm of the National Government upon which the responsibility has been placed is assumed to be sufficiently strong for the purpose, but it appears to be afflicted with the most fatal of all diseases—the *fever of procrastination*.


But the conduct of cleanly inland communities in prohibiting well persons from Jacksonville or other infected places, divested of baggage, is practical ignorance of the nature of the disease, inhospitable and cruel.

Havana reports 30 deaths from yellow-fever during the week ending August 4th, an increase of 13 over the previous week.

Santiago de Cuba, during the week ending July 28th, 7 cases and 4 deaths.

SMALL-POX.—Through Surgeon-General Hamilton's Weekly Abstract of Sanitary Reports, July 13th to August 17th, and other sources, small-pox has been reported during the latter part of June, month of July, and up to the time of closing this summary (August 20th) in Philadelphia; New York; Buffalo, N. Y.; Canton and Norwalk, Conn.; St. Louis and Moberly, Mo.; East St. Louis, Ill.; Toledo, Ia.; Cambridge, Minn.; San Francisco and Los Angeles, Cal.; Nashville, Jackson, Memphis, Albion County and Rutherford County, Tenn. In Philadelphia there have been about 20 deaths—the number of cases not reported. In Tennessee about 50 cases—the number of deaths not reported.

Abroad, during the four weeks ending July 28th, the number of deaths reported from small-pox was: In London, 2; Sheffield, 4; Bradford, 1; Paris, 13; Lyons, 8; Havre, 10; Rheims, 1; Trieste, 14; Prague, 39; St. Petersburg, 12; Warsaw, 34; Bucharest, 5; Havana (during the month of July), 6.

 It would greatly add to the interest of the reports under this head if all correspondents would give the ratio of the *death-rates per 1000 of population per annum*, by which different populations could be compared.

ALABAMA.—*Mobile* (40,000). The Health Officer reports 89 death during June, 1888, of which 30 were under five years of age. Annual death-rate per 1000, 26.7 From zymotic diseases there were 23 deaths, and from consumption, 10.

CALIFORNIA.—The Secretary of the State Board reports the number of deaths during June, 1888, from 87 localities, comprising a population of 702,050, 964, representing an annual death-rate of 16.3 per 1000.

Consumption is credited with 156—16.07 per cent of the total mortality. Pneumonia, 66; bronchitis, 16; congestion of the lungs, 10.

Zymotic diseases, 115: Diphtheria (including croup), 28; typhoid-fever, 35; cerebro-spinal fever, 6; scarlet-fever, 9; measles, 2; remittent and intermittent fevers, 7; whooping-

cough, 5 ; *small-pox*, " although not altogether absent from the State, is confined to San Francisco, where 11 cases were reported during the month. These were nearly all imported from abroad, an event for which the authorities were prepared, the disease prevailing in so many of the Eastern States and our emigration therefrom being so large, that for some time to come we cannot hope for immunity from the disease in small numbers. In Los Angeles there were only a few cases during the month of June, and it is believed that no new cases have been developed for some two weeks past."

San Francisco (300,000—Caucasian, 278,000 ; Chinese, 22,000), deaths, 479—140 under five years. From zymotic diseases, 77 ; diphtheria, 5 ; typhoid-fever, 16. Consumption, 74 ; pneumonia, 41 ; from other lung diseases, 17. Death-rates, white, 19.8 ; Mongolian, 24 : 20.1.

Los Angeles (70,000), 40 ; from consumption, 5 ; acute lung diseases, 2.

Oakland (50,000), 77 ; from consumption, 8 ; acute lung diseases, 9.

San Diego (32,000), 47 ; from consumption, 3 ; acute long diseases, 4.

Sacramento (30,000), 34 ; from consumption, 1 ; acute lung diseases, 2.

CONNECTICUT.—The Secretary reports for June, 1888, the total number of deaths returned by 140 towns, comprising a population of 695,586, 813, representing an annual death-rate of 13.3. Deaths under five years, 161—19.8 per cent.

Small-pox occurred in the towns of Canton and Norwalk, but no case has been reported fatal. Every precaution necessary was taken after the health authorities were notified to protect the public.

The *lowest death-rates* of the 28 towns with 5000 inhabitants and upward were in Killingly, 1.5 ; Vernon, 3.0 ; Groton, 4.5 ; Winchester, 6.3 ; Thompson, 6.4 ; Southington, 6.5.

The *highest death rates* of the 28 towns with 5000 inhabitants and upward were in Wallingford, 19.6 ; Hartford, 18.9 ; Bridgeport, 16.8 ; Stamford, 15.7 ; Windham, 15.6.

DELAWARE.—*Wilmington* (57,000) reports for June, 64 deaths—26 under five years of age—showing an annual death-rate of 13.47 per 1000.

From zymotic diseases there were 8 deaths, and from consumption, 8.

MARYLAND.—*Baltimore* (437,155) reports for five weeks ending June 30th, 874 deaths, of which 427 were under five years of age.

Annual death-rate, 20.5 per 1000. From zymotic diseases there were 223 deaths, and from consumption, 110.

MASSACHUSETTS.—The *Nineteenth Annual Report of the State Board of Health* for 1887, 8 vo, pp. 432, embraces the work of the board during the year on the following topics: "Protection of the Purity of Inland Waters," "Food and Drug Inspection," "Oleomargarine," "Mortality," "Ventilation and Heating of Small Schools."

The first subject is in continuation of the work begun during the latter half of the previous year under the authority of the admirable law conferring upon the board the general oversight and care of inland waters. By the organization of a regular system of chemical analysis of all the domestic water supplies in the State, under the charge of Professor T. M. Drown, the biological researches of Mr. George H. Parker and Dr. E. K. Dunham, and experiments with reference to the use of different soils for the purpose of sewage filtration, under the direction of Hiram F. Mills, C.E. (member of the board), a large amount of valuable information has been elucidated of practical importance generally. The chief engineer, Mr. F. P. Stearns, reports upon seven plans relating to water supply and eleven relating to sewerage during the year—all requiring the approbation of the board before execution.

As a general result of special examinations with reference to water supplies, he deduces the following conclusions:

"That it is practicable in many instances to obtain a supply of water from a bed of porous gravel adjoining an unfailing pond or stream, without reference to the amount of water that may be obtained from the land side.

"That where the soil does not contain soluble matters to injuriously affect the water, it will, when so obtained, be

much purer by chemical and biological standards, will be much cooler in summer, and in all sanitary and commercial features will be much better than water taken directly from the pond or stream.

“That since it is impracticable in many cases to get an entirely satisfactory supply of water, it is preferable to obtain a ground water supply by filtration from a surface source that is somewhat objectionable, rather than take surface water directly from a source that is some degrees less objectionable.

“ . . . It should not be inferred that the results above indicated will be obtained where only a thin layer of sand or gravel intervenes between the surface source and the filter gallery, and the filtration is continuous, since examinations, in several instances, of water filtered under such circumstances, have shown it to be worse than that which had not been filtered ; nor should it be inferred that it is safe to take a supply by filtration from a seriously polluted body of surface water, since, while the chemical analyses show by far the larger portion of decomposable organic matter indicated by the ammonias to have been removed by filtration, yet the small amount remaining may be of harmful nature, and there is no definite assurance that the purifying powers of the soil may not at times be overtaxed.”

The plan of *sewage disposal* at Medfield, with map and diagrams, is an instructive and economical example, on a small scale, of the feasibility of disposing of sewage without nuisance.

The report upon *Inspection of Food and Drugs* is in continuation of the work reported upon from year to year, with additional samples of “1. Food, other than milk ; 2. Milk ; 3. Drugs.” Of 5420 samples examined during the year, the percentages of adulterations of each sort were, respectively, (1) 35.05, (2) 38.33, (3) 27.27 : 34.26. Special attention is invited to the percentage of adulteration in the different years, 1884 to 1887, inclusive : 54.2, 42.4, 38.7, 34.3—showing a considerable decrease. With regard to milk, exclusively, of 3081 samples examined, 38.3 per cent fell below the standard. In 1884 it was 69 per cent. But the percentage is still disgracefully high in Massachusetts, as elsewhere, and abundantly suggestive of the necessity of severer penalties than have yet

been imposed for the continued practice of adulteration ; and, moreover, as suggested by the reporter :

“ Greater immunity of the population of our large cities from epidemics of certain infectious diseases, such as typhoid-fever, diphtheria, and scarlet-fever, would undoubtedly be secured by a careful inspection of all dairy farms (which furnish milk to cities and towns). ”

The proportion of some of the other articles examined was as follows : Butter, 58 samples, 13 adulterated ; lard, 19, 12 with tallow ; olive oil, 17, 11 spurious ; French vegetables (canned), 32, 22, chiefly with copper ; honey, 35, 19 chiefly consisted of glucose ; black pepper, 146, 53 ; white pepper, 71, 32 ; mustard, 122, 32 ; orange cider—“ Nature’s most healthful beverage ”—one sample was examined and found to contain about 15 per cent of sugar, 0.96 per cent of tartaric acid. Baking powder, of 29 samples, 21 contained alum, as follows : Davis, Springfield, Hygienic, Brooks, McGeorge, Aunt Sally, London, Capitol, Holyoke, Dry Yeast, Higgins, White Star, International, Kenton, Sovereign.

Oleomargarine is reported upon with much detail, giving a general review of the subject and its importance as an article of food, processes of its manufacture, inspection under national, State, and local laws, its nutritive value and wholesomeness—all going to show the injustice of the laws restricting its use, and that

“ In nutritive principles, as shown by Professor Atwater (in the *Century*), it compares so favorably with butter as to present a difference almost too slight to be estimated, except by the chemist. ”

Drugs were found to be adulterated or deficient in quality to the extent of 27.2 per cent. Besides which 50 samples of *proprietary medicines* were examined, with special reference to the percentage of alcohol.

“ *Scotch Oats Essence* ” was found to contain 35 per cent of alcohol and *one fourth of a grain of morphia to the ounce*.

“ Parker’s Tonic—A purely vegetable extract—stimulus to the body without intoxication, ” was found to be an equally infamous fraud, containing 41.6 per cent of alcohol. Of these and the rest we purpose a more extended notice hereafter.

The Ventilation of School-rooms Heated by Stoves is the sub-

ject of an interesting report by J. G. Pinkham, M.D., showing by numerous diagrams its practicability with good ventilation.

Mortality rates are based upon an estimated population of 1,100,000. Total number of deaths, 24,060 ; under five years, 8814 ; infectious diseases, 4462 ; consumption, 3396 ; acute lung diseases, 2582 ; typhoid-fever, 502 ; diarrhœal diseases, 1985 ; scarlet-fever, 347 ; measles, 257 ; diphtheria and croup, 992 ; puerperal-fever, 43 ; whooping-cough, 141 ; malarial-fever, 5 ; small-pox, 4 ; erysipelas, 43. Ratio per 1000 population (all causes), 21.87.

Ratio per 1000 deaths : Deaths under five, 366.3 ; infectious diseases, 185.37 ; consumption, 141.1 ; acute lung diseases, 107.3 ; typhoid-fever, 20.86 ; diarrhœal diseases, 82.50 ; scarlet-fever, 14.42 ; measles, 10.68 ; diphtheria and croup, 41.2 ; puerperal-fever, 1.79 ; whooping-cough, 5.86 ; malarial-fever, .21 ; small-pox, .17 ; erysipelas, 1.79. The mortality rates of the cities were : Boston, 401,480, 25.08 ; Worcester, 73,682, 19.87 ; Lowell, 67,851, 27.53 ; Cambridge, 62,605, 21.18 ; Fall River, 59,759, 26.82 ; Lynn, 49,594, 17.88 ; Lawrence, 39,741, 24.51 ; Springfield, 39,153, 19.15 ; New Bedford, 34,361, 24.24 ; Somerville, 32,195, 19 ; Salem, 28,509, 25.92 ; Holyoke, 29,889, 21.91 ; Chelsea, 26,938, 20.90 ; Taunton, 24,422, 20.22 ; Haverhill, 23,932, 19.59 ; Gloucester, 22,690, 19.48 ; Brockton, 24,795, 14.39 ; Newton, 20,656, 15.59 ; Malden, 18,090, 17.74 ; Fitchburg, 16,147, 20.98 ; Waltham, 15,971, 18.03 ; Newburyport, 13,796, 27.62 ; Northampton, 13,322, 18.09.

Boston (400,000) reports for June, 740 deaths—224 under five years of age—making the annual death-rate, 22.2 per 1000.

From zymotic diseases there were 100 deaths, and from consumption, 92.

MICHIGAN.—*Fourteenth Annual Report of the State Board for the Fiscal Year Ending September 30th, 1886*, pp. 390. Excepting the elaborate report on the *Causation of Pneumonia*, by Henry B. Baker, M.D., Secretary of the Board, and the papers of Professor V. C. Vaughan on *Tyrotaxon*, this volume consists of correspondence and statistical matter ; but it is none the less instructive on this account, illustrated as it is by numerous charts and diagrams, showing the conditions of preventable diseases, and the tabulated results of the measures used for stamping them out.

Professor Vaughan's paper on "Tyrotoxicon" has already appeared in our pages, in full, by permission (Vol. XVII.).

The Causation and Prevention of Pneumonia, by Dr. Baker, is an elaborate investigation of very great interest, comprehending an immense amount of labor in Michigan and elsewhere, covering a period of sixteen years, which the author has summed up into several pages of statistics and diagrams which seem to prove that pneumonia is controlled by the temperature and humidity of the air; that it increases after the atmosphere is cold and dry, and decreases after the air is warm and moist. One would suppose that such climatic causes could not be controlled, but Dr. Baker points out how he thinks the disease may be greatly lessened by controlling the temperature and especially by moistening all air which requires to be warmed in all buildings, public and private. During the time of greatest danger from the disease (cold weather), most people spend half their time in buildings where such conditions can be controlled, and Dr. Baker claims that it is the long-continued exposure that causes this disease; so that, if the indoor conditions are properly cared for, this disease will be greatly lessened.

While he recognizes the distinctions of pneumonia by pathological conditions, its relations to other diseases, and possibly to micro-organisms, he contends the disease is all of one and "the most common kind, unless it be that the causation of all kinds is similar, so far as relates to the controlling condition."

Professor Henry F. Lyster, A.M., M.D., member of the board, gives an *Analysis of 500 Deaths* occurring at ages between 18 and 65 in the Michigan Mutual Life Insurance Company during the first 18 years of its existence, 1867 to 1886, as follows: Deaths, 500; average age, 45.89; average duration of policy in years, 4.38; average height in feet and inches, 5-9.03; average weight in pounds, 156.56; average expansion of chest in inches, 3.26. The percentages of deaths from certain diseases were: Phthisis (all forms), 22.80; pneumonia, 12.40; enteric-fever, 9.40; apoplexy and paralysis, 7.80. The Secretary reports for the month of June, 1888, compared with the preceding month, the returns indicate that cholera morbus and diarrhœa increased, and that pneumonia,

influenza, tonsillitis, bronchitis, and erysipelas decreased in prevalence.

Including reports by regular observers and others, diphtheria was reported present in Michigan in the month of June, 1888, at 19 places, scarlet-fever at 30 places, typhoid-fever at 10 places, measles at 42 places, and small-pox at Detroit. Reports from all sources show diphtheria reported at 4 places less, scarlet-fever at 24 places less, typhoid-fever at 4 places less, measles at 22 places less, and small-pox at the same number of places in the month of June, 1888, as in the preceding month.

Compared with the average for the month in the nine years, 1879-87, measles were more prevalent, and intermittent-fever, remittent-fever, diarrhœa, whooping-cough, tonsillitis, diphtheria, and dysentery were less prevalent in June, 1888.

Compared with the preceding month, the temperature was much higher, the absolute humidity was considerably more, the relative humidity was more, the day ozone was the same, and the night ozone was less. Compared with the average of corresponding months in the nine years, 1879-87, the temperature was slightly higher, the absolute humidity was slightly more, the relative humidity was the same, the day and the night ozone were less.

Poisoning by Tyrotoxicon.—At the quarterly meeting of the board, July 10th, a communication was read from Dr. William C. West, of Monroe, Mich., concerning about 20 cases of cheese poisoning in that city. Those poisoned “were taken at first with great prostration—a sensation as though they would die. This was followed by vomiting, which would relieve them somewhat. The vomiting was very severe in most of the cases. The vomiting was followed by diarrhœa. There was pain in the stomach and bowels.” All who ate of the cheese were affected.

Detroit (220,000) reports for June, 290 deaths—84 under five years of age—showing an annual death-rate of 16.31 per 1000. From zymotic diseases there were 66 deaths, and from consumption, 21.

MINNESOTA.—*Public Health*—the official bulletin of the State Board of Health—reports for June, 1888: Diphtheria, 33 cases, 13 deaths; and scarlatina, 11 cases, 5 deaths.

Diseases of Animals.—Cases of glanders remaining isolated or not accounted for, 44 ; reported during the month, 16 ; killed, 13 ; released, 1 ; isolated, 6. Remaining July 1st, isolated or not accounted for, 46.

Minneapolis (175,000) reports 201 deaths during June, of which 94 were under five years of age.

Annual death-rate, 11.78 per 1000. From zymotic diseases there were 31 deaths, and from consumption, 21.

For the year ending March 31st, 1888 : Population, 175,000 ; deaths, 2674—death-rate, 15.3 ; 1054—39.1—were of children under five years ; 534—19.79 per cent—were caused by zymotic diseases, and 286—10.7 per cent—by consumption.

MISSOURI.—*St. Louis* (440,000) reports for June, 814 deaths—436 being under five years of age—making an annual rate of 22.2 per 1000.

From zymotic diseases there were 296 deaths, and from consumption, 59.

NEW HAMPSHIRE.—*Manchester* (41,000) reports for June, 58 deaths—under five years of age, 22—making an annual death-rate of 16.83 per 1000. From zymotic diseases there were 10 deaths, and from consumption, 9.

NEW JERSEY.—*Hudson County* (270,232) reports for June, 537 deaths—245 under five years—making the annual death-rate, 23.8 per 1000. From zymotic diseases there were 153 deaths, and from consumption, 47.

Newark reports for 1887 : Population, 167,460 ; births, 4846—birth-rate, 29.01 ; marriages, 1632—marriage-rate, 9.77 ; deaths, 3985—death-rate, 23.86. Deaths under five years of age, 1692—42.36 per cent of total ; 752—18.8 per cent of total—were caused by zymotic diseases, and 466—11.7 per cent—by consumption.

NEW YORK.—Official *Bulletin* of the State Board of Health reports the total mortality from the returns of 128 localities, comprising a population estimated at 3,808,000, for the month of June, 1888, 8368, representing an annual death-rate per 1000 of 16.82 (16.80 in May). The proportion of

deaths from zymotic diseases is increased, being 227.34 per 1000 deaths from all causes (175.10 in May); the increase is from diarrhoeal diseases, which cause 97.00 deaths per 1000 (14.50 in May). From diphtheria there is a lessened death-rate; from other zymotic diseases there is no material change. From small-pox but one death occurred outside of New York City; it has been reported from no new localities. From acute respiratory diseases the number of deaths is reduced nearly one half, and from consumption is much lessened. Besides the total of 52,458 deaths for six months, 2100 delayed returns have been received. During the six months there was a considerably larger death-rate from scarlet-fever and also from diphtheria than in the same period of last year; that of measles and diarrhoeal diseases is less, and of all zymotic diseases less by about 8 deaths per 1000. During the six months measles shows increase in prevalence month by month; diphtheria has diminished.

Severally, the populations and death-rates are as follows:

Maritime District.—New York City, 1,526,081, 27.40; Brooklyn, 757,755, 24.30; Gravesend, 5000, 34.00; New Utrecht, 4742, 30.37; Long Island City, 21,000, 25.71; Newtown, 10,000, 24.00; Oyster Bay, 12,000, 10.00; Hempstead, 18,000, 15.44; North Hempstead, 8000, 13.50; Huntington, 8100, 13.20; Jamaica, 10,089, 14.00; Southold, 7267, 11.56; Sag Harbor, 3000, 16.00; New Brighton, 15,000, 20.80; Edgewater, 12,000, 25.00; Northfield, 7014, 24.00; Westfield, 7000, 5.14; Yonkers, 27,500, 20.07; Westchester, 6900, 15.65; Sing Sing, 6500, 12.92; New Rochelle, 5500, 19.64.

Hudson Valley District.—Albany, 98,000, 21.30; Troy, 65,000, 19.3; West Troy, 13,000, 17.54; Hoosick Falls, 6000, 16.00; Lansingburg, 10,000, 32.40; Green Island, 5000, 14.40; Greenbush, 8000, 18.00; Coxsackie, 4000, 9.00; Catskill, 4500, 16.00; Hudson, 10,000, 24.00; Kingston, 21,000, 17.71; Ellenville, 3000, 12.00; Marbletown, 4000, 21.00; Esopus, 4736, 17.85; Saugerties, 4000, 24.00; Poughkeepsie, 20,200, 21.38; Fishkill, 10,732, 20.12; Wappinger Falls, 5000, 19.20; Newburg, 20,000, 21.60; Port Jervis, 9500, 25.20; Nyack, 5000, 16.80; Goshen, 4387, 24.30; Ramapo, 5000, 16.80.

Adirondack and Northern District.—Argyle, 3700, 16.22;

Salem, 3500, 10.30 ; Fort Ann, 4267, 8.43 ; Fort Edward, 4880, 4.85 ; Glens Falls, 10,000, 10.80 ; Crown Point, 4287, 8.38 ; Malone, 9000, 18.45 ; Potsdam, 4000, 21.00 ; Ogdensburg, 11,000, 20.73 ; Gouverneur, 5500, 6.54 ; Ellisburg, 4811, 7.30 ; Plattsburg, 7000, 7.00 ; Watertown, 12,200, 35.41 ; Lowville, 3188, 3.75 ; Clayton, 4314, 25.05.

Mohawk Valley District.—Schoenectady, 20,000, 15.00 ; Schoharie, 3350, 3.60 ; Cobleskill, 3371, 7.12 ; Amsterdam, 14,000, 21.43 ; Johnstown, 6000, 20.00 ; Gloversville, 10,000, 16.80 ; Little Falls, 7200, 21.66 ; Ilion, 4200, 20.00 ; Utica, 43,000, 17.30 ; Rome, 12,045, 14.00 ; Boonville, 4000, 6.00 ; Camden, 3400, 24.70 ; Waterford, 5400, 26.66 ; Ballston Spa, 3200, 30.00 ; Saratoga Springs, 10,000, 28.80.

Southern Tier District.—Binghamton, 25,000, 14.40 ; Owego, 6000, 20.00 ; Candor, 4323, 22.20 ; Waverly, 3000, 32.00 ; Elmira, 25,000, 14.88 ; Horseheads, 3500, 13.42 ; Bath, 3500, 17.14 ; Corning, 8000, 12.00 ; Olean, 8000, 15.00 ; Salamanca, 6000, 20.00 ; Jamestown, 14,000, 7.71 ; Westfield, 3000, 12.00.

East Central District.—Walton, 3540, 23.00 ; Delhi, 3000, 32.00 ; Cooperstown, 3000, 8.00 ; Oneonta, 7000, 24 ; Worcester, 3000, 20.00 ; Cazenovia, 4363, 13.70 ; Brookfield, 3685, 13.03 ; Hamilton, 3912, 12.30 ; Syracuse, 78,000, 17.54 ; Cortland, 9000, 13.33 ; Homer, 3000, 12.00 ; Baldwinsville, 3000, 16.00.

West Central District.—Auburn, 26,000, 13.89 ; Groton, 3450, 24.35 ; Ithaca, 10,000, 13.20 ; Waterloo, 4500, 16.00 ; Hector, 5000, 16.80 ; Seneca Falls, 6000, 12.00 ; Manchester, 4000, 9.00 ; Phelps, 7000, 10.30 ; Canandaigua, 6300, 20.95 ; Geneva, 6000, 16.00 ; Penn Yan, 4500, 13.34 ; Batavia, 7000, 10.30 ; Leroy, 5000, 9.60.

Lake Ontario and Western District.—Oswego, 24,000, 15.50 ; Richland, 4000, 6.00 ; Fulton, 4000, 15.00 ; Clyde, 3000, 12.00 ; Lyons, 6000, 16.00 ; Newark, 3500, 7.00 ; Palmyra, 4800, 32.50 ; Rochester, 110,000, 14.73 ; Brockport, 4500, 16.00 ; Medina, 4000, 15.00 ; Albion, 5000, 17.20 ; Lockport, 15,000, 12.00 ; Buffalo, 230,000, 18.10 ; Tonawanda, 4900, 24.45 ; Amherst, 4578, 13.10.

NORTH CAROLINA.—Official *Bulletin* reports for June: 11 towns, aggregate population, whites, 47,285 ; colored, 47,715 :

95,000. Deaths, white, 85 ; colored, 111 : 196. Death-rates, white, 21.6 ; colored, 27.9 : 24.7.

Review of the Health of the State for the month :

Typhoid-fever was reported from 31 counties. Of these, 13 were western, 13 were middle, and 5 were eastern.

Pneumonia in 1 western county—Rowan.

Measles in 10 counties—6 middle and 4 eastern.

Whooping-cough in 10 counties—1 eastern, 6 middle, and 3 western.

Mumps in 1 eastern, 1 middle, and 1 western county.

Diphtheria in 1 western and 3 middle counties.

Cerebro-spinal meningitis in 1 eastern county—Martin.

Pernicious malarial-fever in 1 western, 1 middle, and 2 eastern counties.

Hæmorrhagic malarial-fever in 1 eastern county—Martin.

Chicken-pox in 1 eastern and 2 middle counties.

Hog cholera in 1 western and 2 middle counties.

Chicken cholera in 1 middle county—Warren.

OHIO.—*Monthly Sanitary Record*, the official publication of the State Board of Health, reports in abstract for June, 1888, localities, populations, and annual death-rates, as follows :

Akron, 30,000, 12.8 ; Bellaire, 12,000, 21.00 ; Bellevue, 3500, 3.43 ; Bluffton, 1300, 27.69 ; Cincinnati, 325,000, 21.26 ; Cleveland, 225,000, 15.00 ; Columbus, 90,000, 12.25 ; Cuyahoga Falls, 2800, 8.57 ; Dayton, 52,000, 14.07 ; Defiance, 7000, 12.00 ; Delaware, 8000, 13.50 ; East Liverpool, 6000, 22.00 ; Hamilton, 20,000, 12.00 ; Huron, 1200, 10.00 ; Mansfield, 15,000, 7.20 ; Marion, 5000, 9.60 ; Miamisburg, 3000, 24.00 ; Middletown, 7500, 4.80 ; Plymouth, 1500, 16.00 ; Portsmouth, 14,000, 18.85 ; Ravenna, 4000, 12.00 ; Shawnee, 4000, 12.00 ; Shelby, 2500, 4.80 ; Steubenville, 15,000, 8.00 ; Toledo, 80,000, 10.95 ; Urbana, 8000, 6.00 ; Wadsworth, 2500, 9.60 ; Warren, 8000, 9.00 ; Waverly, 1600, 22.50 ; Wellington, 2000, 6.00 ; Xenia, 10,000, 19.20 ; Youngstown, 24,300, 10.37. Total population, 1,018,100 ; average death-rate, 15.76.

During the four weeks ending July 6th, diphtheria was reported from Middletown, Elmore, Toledo, Cincinnati, Byesville, Carrollton, East Liverpool, Louisville, Lyons, Milford,

Columbus, Kalida, Lebanon, Harbor, Wilkesville, Orwell, and Dayton.

Scarlet-fever was reported from Cincinnati, Columbus, Cleveland, Toledo, Youngstown, Shreve, Ashtabula, Anna, Kalida, Auburn, Elmore, Miltonsburg, Gettysburg, Mount Pleasant, Lucas, Louisville, Caldwell, Xenia, Milford Centre, Hamden Junction, Dayton, and Scio.

Typhoid-fever was reported from Bluffton, Dayton, Botkins, East Palestine, Van Wert, Gillespieville, East Liverpool, Flushing, Milford, Attica, Mainesville, Port Clinton, Waynesfield, Xenia, Cincinnati, and Wilkesville.

Twenty-three per cent of all observers met with measles, 251 cases being reported.

Six hundred and fifty-one cases of diarrhœa, dysentery, cholera morbus, and cholera infantum were reported for the four weeks ending July 6th, against 152 cases during the four weeks ended June 1st. Additional cases of cheese poisoning were reported at New Washington, Ravenna, and Weymouth.

PENNSYLVANIA.—*Philadelphia* (1,016,758) reports for the five weeks ending June 30th, 1933 deaths, of which 782 were under five years of age; annual death-rate of 19.9. From zymotic diseases there were 304 deaths, and from consumption, 254.

Pittsburgh (200,000) reports for five weeks ending June 30th 521 deaths, of which 299 were under five years of age. Annual death-rate per 1000, 25.6. From zymotic diseases there were 26 deaths, and from consumption, 44.

TENNESSEE.—The State Board *Bulletin* reports officially the principal diseases named in the order of their greater prevalence in the State for June, were dysentery, malarial fevers, diarrhœa, cholera morbus, cholera infantum, consumption, pneumonia, and tonsillitis.

Typhoid-fever is reported in the counties of Davidson, Decatur, Hamilton, Hawkins, Henry, Humphreys, Knox, Maury, McMinn, Montgomery, Overton, Pickett, Smith, Sullivan, and Wilson. Measles in Cannon, Cocke, Henry, Lake, Moore, Rhea, and Rutherford.

Whooping-cough in Crockett, Gibson, Grundy, Hawkins,

Marshall, Pickett, and Sumner. Mumps in Cocke, Grundy, Marshall, and Stewart. Scarlet-fever in Anderson, Franklin, and Knox. Diphtheria in Knox and Shelby. Cerebro-spinal meningitis in Gibson and Sullivan. German measles in Henry. Small-pox in Shelby. Roseola in Moore. Varicella in Grundy.

In the chief cities the respective annual death-rates for the month per 1000 of population are reported as follows :

Chattanooga, white,	24.50 ;	colored,	37.84 : 29.18
Clarksville,	“ 4.80 ;	“	32.00 : 15.00
Columbia,	“ 0.00 ;	“	6.00 : 2.40
Knoxville,	“ 20.39 ;	“	34.70 : 23.32
Memphis,	“ 15.22 ;	“	40.67 : 4.25
Nashville,	“ 12.03 ;	“	31.39 : 18.96
Tullahoma,	“ 4.60 ;	“	20.00 : 7.50

WISCONSIN.—*Milwaukee* (185,000) reports for June, 280 deaths, of which 77 were under five years of age. Annual death-rate, 18.2 per 1000.

From zymotic diseases there were 34 deaths, and from consumption, 25.

Death-rates in foreign cities during the second quarter, 1888, as follows : London, 4,282,921, 16.8 ; Liverpool, 599,738, 18.0 ; Glasgow, 526,088, 23.0 ; Birmingham, 447,912, 17.5 ; Manchester, 378,164, 25.5 ; Dublin, 353,082, 24.5 ; Leeds, 351,210, 19.0 ; Sheffield, 321,711, 19.0 ; Edinburgh, 262,733, 18.9 ; Bradford, 229,721, 16.9 ; Belfast, 227,022, 26.3 ; Bristol, 226,510, 17.7 ; Hull, 202,359, 16.9 ; Newcastle, 159,003, 14.6 ; Amsterdam, 389,916, 23.3 ; Rotterdam, 193,658, 21.2 ; Hague, 149,477, 18.8 ; Paris, 2,260,945, 22.8 ; Lyons, 401,930, 21.2 ; Marseilles, 376,143, 28.3 ; Nantes, 127,482, 25.1 ; St. Étienne, 117,875, 23.7 ; Havre, 112,074, 32.4 ; Rouen, 105,672, 33.5 ; Rheims, 97,903, 33.9 ; Nancy, 81,593, 24.1 ; Amiens, 80,288, 27.7 ; Nice, 78,482, 24.6 ; Berlin, 1,414,980, 19.9 ; Hamburg, 543,670, 27.2 ; Breslau, 313,451, 26.9 ; Munich, 275,000, 30.5 ; Dresden, 259,142, 21.5 ; Leipzig, 181,324, 18.5 ; Cologne, 175,200, 22.7 ; Magdeburg, 171,086, 21.4 ; Frankfort-on-the-Main, 163,655, 20.9 ; Koenigsberg, 156,441, 27.7 ; Hanover, 148,458, 18.3 ; Dusseldorf, 125,384,

19.2 ; Nuremberg, 122,832, 29.7 ; Bremen, 121,464, 20.0 ; Chemnitz, 118,926, 35.1 ; Dantzig, 118,037, 25.3 ; Stuttgart, 117,861, 18.8 ; Strasburg, 115,870, 30.1 ; Elberfeld, 113,195, 19.3 ; Altona, 111,780, 25.1 ; Barmen, 106,749, 20.9 ; Aix-la-Chapelle, 100,982, 21.9 ; Mayence, 69,119, 23.8 ; Metz, 54,558, 24.8 ; Basel, 73,963, 18.3 ; Geneva, 52,516, 15.4 ; Berne, 50,220, 23.3 ; Lausanne, 32,954, 23.6 ; Zurich, 28,062, 13.7 ; Chaux-de-Fonds, 24,372, 27.6 ; Vienna, 800,836, 29.2 ; Pesth, 442,787, 33.1 ; Prague, 295,857, 37.2 ; Trieste, 156,042, 27.7 ; Cracow, 67,000, 38.0 ; Debretzin, 56,168, 32.1 ; Presburg, 49,003, 51.8 ; Copenhagen, 300,000, 23.3 ; Stockholm, 221,549, 20.9 ; Christiania, 136,791, 24.3 ; Helsingfors, 51,515, 24.6 ; St. Petersburg, 988,016, 37.7 ; Warsaw, 439,174, 26.1 ; Odessa, 268,000, 24.4 ; Venice, 150,502, 22.6 ; Bucharest, 206,000, 29.8 ; Yassy, 82,856, 27.4 ; Brussels, 462,069, 20.6 ; Anvers, 220,123, 19.3 ; Gand, 147,912, 24.0 ; Liege, 137,566, 18.0 ; Bruges, 51,341, 33.3 ; Malines, 48,971, 19.4 ; Verviers, 47,744, 19.3 ; Louvain, 39,460, 22.8 ; Tournay, 36,536, 25.2 ; Seraing, 31,322, 17.1 ; Borgerhout, 28,781, 20.0 ; Mons, 25,755, 21.7 ; Jumet, 23,455, 20.5 ; Alost, 23,399, 19.5 ; Charleroy, 21,490, 16.4 ; Roulers, 20,163, 22.2.

Populations and death-rates returned during the first quarter, 1888 : Utrecht, 81,334, 31.5 ; Groningen, 52,996, 23.8 ; Maestricht, 31,483, 26.3 ; Lille, 188,272, 32.9 ; Roubaix, 100,456, 25.5 ; Limoges, 63,765, 31.2 ; St. Quentin, 46,746, 24.4 ; Bayonne, 27,289, 28.6 ; La Rochelle, 16,616, 46.2 ; Lemberg, 120,127, 35.1 ; Grätz, 105,274, 35.7 ; Brünn, 86,125, 37.7 ; Cracow, 70,084, 34.4 ; Moscow, 753,469, 33.9 ; Rome, 382,973, 30.6 ; Milan, 373,352, 36.4 ; Turin, 294,826, 34.1 ; Genoa, 183,591, 32.9 ; Bologna, 133,789, 27.5 ; Livourne, 101,722, 27.0 ; Madrid, 480,000, 42.2 ; Valencia, 143,239, 35.3 ; Saragossa, 87,922, 45.0 ; Murcia, 80,000, 41.1 ; Palma, 59,555, 40.7 ; Carthagená, 54,313, 60.8 ; Badajoz, 23,000, 45.7 ; Lisbon, 242,297, 40.5 ; Algiers, 71,339, 34.6 ; Bombay, 773,196, 26.5 ; Calcutta, 433,219, 29.8 ; Madras, 398,777, 41.6 ; Buenos Ayres, 428,448, 28.1.

By latest reports received, not enumerated in the above, during the four weeks ending July 12th : Cairo, 553,188, deaths, 528—196 from “diarrhœal diseases ;” death-rate, 77.7.

Alexandria, 181,703, deaths, 200 ; from "diarrhœal diseases," 65 ; death-rate, 57.2.

Suez, 12,406, deaths, 16 ; from "diarrhœal diseases," 6 ; death-rate, 43.8.

Port Said, 10,693, deaths, 9 ; "diarrhœal diseases," 4 ; death-rate, 43.8.

GREAT GAIN.—"If the question be asked, Where is the proof that our preventive measures—our sanitation, vaccination, and isolation—have had the results we speak of, the answer is at hand. It is given by the Registrar-General in the language of figures. He points out that, according to the newest English life-table, the children born in England in any one year have now divided among them 'nearly two million years of life'—more than would have been the case thirty-five years ago. In England and Wales the annual mortality per million of population per annum has been as follows :

1861-65	1866-70	1871-75	1876-80	1881-85
22,595	22,436	21,975	20,817	19,310

Comparing the first period and the last, the difference is 3285 per million, and taking the population at 30,000,000, the total annual saving is about 100,000 lives. And if for every death there are twenty cases of sickness, then we have two million less cases of sickness in the first period. . . . You can count the cost of each case of sickness, of lost work, of doctors' bills, and so on, and also the monetary value of each of the 100,000 lives saved. And you can put all this as an income against the interest on the money spent in sanitary improvements, in water works, sewage works, vaccination grants, officials' salaries, etc., and even on this lowest ground—on this merely commercial basis—we find that cleanliness is next to godliness, resembles godliness itself in being 'great gain.' " John C. M'Vail, M.D., Presidential Address before the Sanitary Association of Scotland.—*The Sanitary Journal*, July 14th, 1888.

LITERARY NOTICES.

THE SANITARIUM at Battle Creek, Mich., is the subject of a beautifully illustrated pamphlet by James Clement Ambrose, which, all who would become familiar with the largest and, all things considered, the best-appointed institution of the kind in the United States, if not, indeed, elsewhere, should read, and learn the *why* of such an institution and of its situation and conditions.

The Sanitarium of the present is the outcome of the combined faith in the salutary effects of an abundant supply of pure air, pure water, and well-regulated diet, with charity, of a few of the citizens of Battle Creek twenty-two years ago. They had apparently acquired such knowledge of the healthfulness of the situation from those who had preceded them from the foundation of the settlement in 1831, and enjoyed such a measure of good health among themselves, as to justify the inference that nothing else was necessary.

The stockholders from the outset bound themselves never to receive any dividends, but to spend all the profits of the Institution in improving the facilities for the care of the sick poor. Ten years' experience sufficed to establish the continued healthfulness of the situation, and, in part at least, for this reason, its desirability as a centre of population and the aggregation of people—the necessity for elaboration. Moreover, it had become manifest that, however excellent the means at first provided, they could not meet all conditions. Fortunately, the Institution had acquired such a reputation that little difficulty was experienced in providing for its expansion.

In 1876 it was reorganized on a scale sufficiently comprehensive to meet all the requirements of rest, medical and surgical treatment. Several new buildings were erected, and the situation, with regard to soil, drainage, water supply, cleanliness, and purity of the atmosphere, was eligibly chosen. And here it may be remarked that the situation of Battle Creek, five hundred feet above the level of the sea, under the lee of the great northern forests of Michigan in conjunction with the climatic softening of the numerous lakes round about,

is remarkable for its healthfulness: the death-rate of Battle Creek, with about 15,000 inhabitants, being only 7 per 1000.

The site of the Sanitarium is a knoll of seven acres in extent overlooking the city. There are two five-story buildings, equal to the accommodation of four hundred patients, including commodious suites of rooms, parlors, bath-rooms, baths—Turkish, Russian, and Battle Creek—Swedish Movement Cure apparatus, etc., and seventeen cottages.

The warming, ventilation, and electric lighting are effected on the most improved principles. The water supply is abundant and pure; the drainage as perfect as art can make it; and the appointments—professional, nursing, subsistence, and housekeeping, under an executive system believed to be what it is intended—complete in every particular.

ALDEN'S MANIFOLD CYCLOPÆDIA OF KNOWLEDGE AND LANGUAGE. Vol. I., A—America. While this work makes no pretence to originality in treatment of subjects, it nevertheless possesses much in combination—embracing the qualities of an elaborate dictionary in conjunction with cyclopædic knowledge. It is profusely illustrated, and the pictures are of the same general character as the text—remarkable for concise lucidity. Altogether, accepting this volume as an index to those which are to follow, we commend the work to all readers and students who would possess a dictionary of the English language and a manual of universal knowledge combined. Fifty cents per volume for cloth, 65 cents for half morocco binding; postage, 10 cents extra. John B. Alden, publisher, 393 Pearl Street, New York.

ATLAS OF VENEREAL AND SKIN DISEASES. By PRINCE A. MORROW, A.M., M.D., Clinical Professor of Venereal Diseases; formerly Clinical Lecturer on Dermatology in the University of the City of New York; Surgeon to Charity Hospital, etc. Imperial folio atlas, to consist of fifteen parts containing seventy-five chromo-lithographic plates, containing several hundred figures, many of them of life size, in flesh tints and colors, together with descriptive text for each plate, and from sixteen to twenty folio pages of a practical treatise upon venereal and skin diseases; the whole to form one volume. In

the composition of the work, besides Professor Morrow many of the most distinguished authorities on the subjects treated of have been secured as contributors : among them Kaposi and Neumann, of Vienna ; Hutchinson, Fournier, and Hardy, of London ; Ricord, Cullerier, Besnier, and Vidal, of Paris ; Leloir, of Lille ; Keyes, Fessenden, and Piffard, of New York ; Hyde, of Chicago, and others.

Fasciculus VI. now before us, in continuation of the Syphilidæ, Fasciculi IV. and V., reviewed in our June number, and, like those, admirably illustrated with life-like lithographic plates, of which there are in this fasciculus seven : Tubercular Syphilide ; Serpiginous Syphilide—Tuberculo-Ulcerous Syphilide ; Ulcerative Gummata ; Serpiginous Ulcerous Syphilide, and Syphilis Cutanea Ulceroso et Vegetans—Ulcerogummous Syphilide. Some of the figures correspond to natural size, and all are true to nature in the best style of the engraver's art. The text, as in the preceding parts, is very complete, but devoid of redundancy.

THE DRIFT OF THE AGE : PITH OF THE CELEBRATED DIX LENTEN LECTURE. With epigrammatic illustrations from ancient and modern authorities regarding pagan customs of two thousand years ago and Christian habits and tendencies of to-day. Price, 10 cents. This little brochure is worth its weight in gold—it should be read by everybody. The Dwight Print, Springfield, Mass. The American News Company, New York, wholesale agents.

A CHART OF COMPARATIVE PHONOGRAPHY. Fowler & Wells Company, No. 775 Broadway, New York, have published an elaborate chart of comparative phonography, compiled and arranged for the use of students, teachers, and writers of phonography. By ALFRED ANDREWS. Much useful information is given in the explanations that will assist in the learning and teaching of shorthand. Price, 25 cents.

AN ACCOUNT OF A CASE IN WHICH RECOVERY TOOK PLACE AFTER LAPAROTOMY HAD BEEN PERFORMED FOR SEPTIC PERITONITIS DUE TO A PERFORATION OF THE VERMIFORM APPENDIX. With remarks upon this and allied diseases. By HENRY B. SANDS, M.D., Professor of the Practice of Surgery in the College of Physicians and Surgeons, New York ; Attend-

ing Surgeon to the Roosevelt Hospital. Reprinted from the *New York Medical Journal*, will interest all surgeons.

CONDITIONS FAVORABLE TO OUT-OF-DOOR LIFE IN COLORADO. By SAMUEL A. FISK, A.M., M.D., Professor of Diseases of the Nervous System, University of Denver, Col., Member of the American Climatological Association, etc., Denver, Col. Reprinted from the *Boston Medical and Surgical Journal*, is an interesting essay not only with reference to the conditions of out-of-door life in Colorado, but of other places, and may be read with special profit by all persons affected with or predisposed to pulmonary consumption.

LECTURES AND ADDRESSES DELIVERED AT FARMERS' INSTITUTES, held in different counties of Ohio, during winter 1886-87, under the joint auspices of the Ohio State Board of Agriculture, the State University, the State Grange, the State Horticultural Society, and the various County Societies and Local Organizations. Myers Bros., Columbus, O. A pamphlet of one hundred pages, comprehending the discussion of the following interesting subjects: "Co-operative Agriculture," by Rev. J. W. McGregor; "Birds—Their Usefulness to the Farmer," by Howard Jones, M.D.; "What Should the Farmer's Boy Learn?" by Professor John Hancock; "Mental Culture Aids Muscular Lastingness," by Herschel D. Hinckley, M.D.; "Sanitary Talk for the Farmer," by R. Harvey Reed, M.D.; "The Country Home," by Mrs. M. P. Robb; "Drainage," by Hon. J. G. Wagner; "Gravel Roads," by Dr. Schatz; "A Horticultural Poem," by N. H. Abaugh; "Wool—the Most Reliable Crop Produced in Ohio," by Hon. O. G. Cope; "The Sheep as a Profitable Meat Producer," by J. S. R. Hazzard; "Winter Treatment of Domestic Animals," by H. G. Tryon; "Hog Cholera—Cause, Cure, and Prevention," by J. M. Allen; "The Why—Side of Life?" by Mrs. M. Edith Day; "Commercial Fertilizers," by N. W. Lord; and "Barn-yard Manure," by H. A. Weber. Dr. Reed also sends a report on the "Public Water Supply of the City of Mansfield," made by himself before the City Council, at a special meeting held for the purpose, October, 1887.

These papers are almost without exception of practical utility to the well being of agriculturists everywhere, and worthy of extensive circulation.

HAY-FEVER: The First Prize Essay of the United States Hay-fever Association for 1887. By SETH S. BISHOP, M.D., Surgeon to the Illinois Charitable Eye and Ear Infirmary, the South Side Free Dispensary, etc., Chicago, Ill.; reprinted from the *Journal of the American Medical Association*. Hay-fever, he argues, is a functional nervous disease with no organic lesion, chiefly dependent upon hereditary temperaments classed as nervous, liable to be provoked by air dust of any kind—conditions which suggest the remedy: air devoid of dust, ocean air, and that which most nearly approximates it. Medicines are only palliative at best, and not to be depended upon.

A VERY VALUABLE LESSON FOR THOSE WHO USE ANÆSTHETICS. By JULIAN J. CHISOLM, M.D., Professor of Eye and Ear Diseases in the University of Maryland, and Surgeon-in-Charge of the Presbyterian Eye and Ear Charity Hospital of Baltimore City. Read before Baltimore Academy of Medicine, December 6th, 1887. A paper of considerable practical importance on the administration of anæsthetics.

FACTS AND FALLACIES IN CLIMATOLOGY. By H. E. BEEBE, M.D., Sidney, O. A brochure of twenty pages, reprinted from the transactions of the *American Institute of Homœopathy*, 1887, of much interest and practical importance to both physicians and patients, who too often sacrifice lives to local conditions, and blame the climate for it.

SOME PHASES OF EVOLUTION. An Address at the opening of the Memphis Hospital Medical College. By T. J. CROFFORD, M.D., Professor of Physiology, Memphis, Tenn., 1887. The new phase which it is the evident purpose of this address to promote is the recognition of and increasing respect for scientific truth by religionists of all creeds.

CONTRIBUTIONS TO GYNECOLOGY. FASCICULUS I., THE GALVANIC TREATMENT OF UTERINE FIBROIDS. Full text of first fifty cases. By EPHRAIM CUTTER, A.M., Yale, M.D., Harv. et Univ. Penn.; LL.D., Iowa, etc. (Pp. 73. New York: William A. Kellogg.

The reputation of the author of this pamphlet, in the department of curative medicine to which it is confined, is suffi-

ciently well known to assure for it the attention which it worthily deserves from the medical profession generally, but of gynecologists in particular, to the special merits of the treatment which he advocates and exhibits in this detail of cases with remarkably successful results.

OXYGEN AS A THERAPEUTIC AGENT : Its Germicidal and Healing Qualities ; Its Consequent Adaptability to the Treatment of Consumption and Pulmonary and Throat Troubles Generally ; Its Place in Surgery, with a Report of Twenty Cases Treated in the Practice of Dr. Rothwell. By P. D. ROTHWELL, M.D., Denver, Col. A brochure of seventy-four pages, reprinted from *Denver Medical Times*. Price, 50 cents. An old subject newly treated, with some practical and fair illustrations. For example, the author, in getting at his subject, refers to the history of *roasted toad*, which was vaunted as a specific for gout with an energy equalled by himself in his advocacy of the artificial administration of oxygen as *the* remedy for consumption and other diseases, which is scarcely less preposterous than roasted toad for gout.

THE SANITARY INSPECTION OF PASSENGER COACHES, by R. HARVEY REED, M.D., Mansfield, O., is a brochure reprint of twelve pages, from the *Sanitary News*, of a paper which he read before the Section on Public Health and International Hygiene of the Ninth International Medical Congress, Washington, D. C., 1887. It shows a good deal of diligent study with regard to the processes and deficiencies of warming and ventilation, insufficient care in the protection of the water-tanks, etc., with statistical data, and is fruitful in practical suggestions for improvements ; and it should not fail to attract the attention of the railroad companies throughout the country, which it richly merits.

BULLETIN OF THE CHEMICAL SOCIETY OF WASHINGTON, No. 3, February 10th, 1887, to January 12th, 1888. A. C. Peale, M.D., Secretary. Contains the constitution and by-laws of the society, a list of the members and officers, and the Annual Address of the President, E. T. Fristoe, delivered

December 8th, 1887, on *Chemistry as a Factor in Education*, dwelling especially on the relations of chemistry to health in the domicile and to domestic life generally.

CLASSIFICATION OF MENTAL DISEASES. By RALPH L. PARSONS, M.D., Greenmont-on-the-Hudson, near Sing Sing, N. Y. A brochure of a paper read before the Medical Society of the County of New York, reprinted from the *New York Medical Journal*. The author of this paper has long been regarded as an authority in mental diseases, and the proposed classification and tabulation of the types and varieties of insanity which he submits are well known to be based upon close study and extensive experience. It will doubtless receive, as it deserves, the attention of alienists generally.

BITS OF KNOWLEDGE TAKEN FROM ALDEN'S MANIFOLD CYCLOPÆDIA: BAVARIA—BEER ACTS. This is the second number of the series of this popular work, and is, as we took occasion to remark of the first, admirably adapted to the wants of the general reader, giving the gist of universal knowledge in a form so inexpensive as to be well adapted to those for whom it is intended—"the millions;" and its price is made, as a matter of course, very low. Per volume, in cloth, 50 cents; half morocco, 65 cents; postage, per volume, 10 cents. John B. Alden, 393 Pearl Street, New York.

SENATOR WADE HAMPTON, of South Carolina, who contributed an article to the June number of the *Forum* on "What Negro Supremacy Means," has another article in preparation for the same review, which will be a statement of what Mr. Cleveland's administration has done toward reuniting the North and the South and nationalizing the Southern people.

MEDICAL EXCERPT.

BICARBONATE OF SODIUM AS A MILK PRESERVATIVE?—The conseil d'hygiene of the Department of the Seine have taken a decided stand against the use of bicarbonate of sodium for the preservation of milk. The chief arguments in favor of

the position taken are : the short time that it now requires for the milk to reach Paris and be distributed ; the easy application of cold, which preserves it fully as well without changing its composition ; the unpleasantness of the sodium bicarbonate, which, when decomposed by lactic acid, yields a purgative salt very injurious to the health of children.—*Zeitschr. f. Nahrungsm. u. Hygiene, March, 1888.*

DISEASES OF WINE-TASTERS.—A German medical paper says : The diseases of wine-tasters were studied by Donnet of Bordeaux and Dr. C. Marandon, of Dijon. Wine-tasters are frequently suffering with disturbances similar to alcoholism, although the claret-tasters do not swallow the wine, but, on the contrary, reject it, and even rinse their mouths afterward. In one case of Dr. Donnet's a man thirty-two years old used to taste every day thirty or forty samples of wine, occasionally liquors and rum, without ever swallowing any part of them. After two years he became very excitable, lost his appetite, did not sleep well, and suffered with disturbances of sensibility, pains in the breast, a feeling of weakness, difficulty in breathing. He improved after abandoning his profession, although a nervous debility still remained, as noticeable by the facility with which he was set in tears. Another statement made by Dr. Donnet is the great number of apoplexies in Bordeaux, where many persons drink one and a half litres of wine with each meal. This number exceeds the number of apoplexies in any city of the world. Dr. Marandon did not notice any symptoms of intoxication in Burgundy tasters, although some of them would swallow the samples. He remarks that tea-tasters always swallow some tea, and this fact, he says, explains the nervous symptoms they are affected with.—*Mining and Scientific Press.*

BENZOATE OF SODIUM IN THROAT AFFECTIONS.—Dr. L. Boisliniere, of St. Louis, Mo., states that for the last two years he has been using the benzoate of sodium in the treatment of follicular tonsillitis, acute erythema or œdema of the fauces and in diphtheritic affections, with very satisfactory results. He reports fifty-one cases of follicular tonsillitis treated with the following solution :

Benzoate of sodium, 3 i.-3 iv.; glycerine and elixir of Calisaya bark, of each $\frac{3}{4}$ i. One teaspoonful every one or two hours. No local application was used. Relief commonly followed in from twelve to thirty-six hours.—*St. Louis Courier of Medicine*.

THE CHLORIDES AS DISINFECTANTS.—In a recent conversation, Professor Alfred L. Loomis remarked that chloride of zinc had maintained its long-established reputation as a disinfectant, as was shown in Mignel's classification. Sulphurous acid and chlorine were powerful germicides, beyond question, but their every-day use was impracticable, and the bichloride of mercury, although it might be the most potent of all the agents that were chiefly talked about, was hardly to be considered safe for domestic use. But the preparation known as "Platt's Chlorides" (a solution of the chlorides of zinc, lead, calcium, and aluminium), which he had made use of freely for the past five years, both in his own house and among his patients, he considered by far the best for all the sanitary requirements of the household.—*New York Medical Journal*.

A NEW REMEDY FOR DIABETES.—A new drug of, apparently great value has recently been introduced into the market. It consists of powdered Jambul seeds—the seeds of a plant *Syzygium Jambolanum* or *Eugenia Jambolana* found in various parts of India, the Mauritius, Ceylon, and the United States of Colombia. It has been well tested by the medical faculty in England, Germany, and the United States, and is said to be a promising remedy in all cases of diabetes. The action of the drug is to prevent formation of sugar in the system, and so to stay waste; and cases are on record showing that under its influence the special restrictive diet—so obnoxious to diabetes patients—can be dispensed with.—*Cassell's Magazine of January*, 1888.

"WHEELER'S TISSUE PHOSPHATES."—A compound of the phosphates of lime, soda, and iron, with Peruvian and wild cherry barks, is highly commended by many medical practitioners of good repute as an admirable tonic in faulty nutrition, and particularly well adapted to cases of enfeebled digestion and nervous debility, common in chronic malaria.

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EDUCATION IN RELATION TO HEALTH.

BY DANIEL CLARK, M.D., Superintendent of the Asylum for the Insane,
Toronto, Ontario.

IN discussing such a practical matter as education, we may consider the brain and mind as a copartnership in which the two members of the firm must be mutually affected. In this aspect of the matter, we may say the organ and the mind are correlatives.

It may also be granted that a healthy brain is needed to do normal mental work. When there is a feeble brain there is also a feeble mind. Vigor and robustness are needed in both. Scope and intensity and harmony must be among the capacities of this duality. As well expect to bring out of a Jew's-harp the melody and harmony of an organ as to attempt to evolve from a flabby and sluggish brain the ideation and mental combinations of a healthy and natural man. The unstrung lyre cannot produce sweet sounds, even if struck by the hand of genius. So mind phenomena can only be produced according to the tone, scope, and health of the organ. A good instrument, in tune and used moderately, will fulfil its function of music producing.

The brain is a wonderful organ in its construction and adaptation. It is the least organized organ in the body, hence its capacity for many-sided work. At the same time it has to be tenderly dealt with, as its powers of restoration are low. Its ordinary work is enormous, seeing that one fifth of all the blood in the body is needed to keep up its vitality. It is only a meshwork of tubes and cells, among which blood vessels spread everywhere. The cells are in every head by the mill-

ions, and every emotion, thought, and volition means the work and death of hundreds of these cells. Nature has immediately to fill their places through its blood-supply, or if not we have insanity or death. In the battle of life each cluster of cells is a phalanx, and as Scott describes the serried ranks at Flodden so are they :

“ Each stepping where his comrade stood,
The instant that he fell.”

It will then be seen that if we call upon the reserves in our daily struggles we can have no conserving forces to fill the breaches caused by the dead which are constantly being carried off in the ambulances of nature. As I have said, the brain is simple in construction because of its many and divers functions. An organ with a specific work to perform is complicated because of this specialty. It is built up with an object in view, and all its arrangements focalize to one result. This is true of the liver, kidneys, and digestive apparatus. The clock is arranged to do one thing—namely, measure time. The steam-engine is made to generate power and apply it by steam. They are good for nothing else, as they were made for those specific purposes. The boy's pocket-knife, the crowbar, the hoe, and the shovel are useful in many ways, because they are simple in their manufacture and general in their uses. It will be seen then how necessary it is to have the organ of the mind a simple instrument to do its multifarious work. Sensation, ideality, volition, memory, imagination, emotion, affection, desire, passion, and all the forms of automatic physical life are only part of the phenomena manifested by nerve operations. Were it complex in its functions, its range of possibilities must necessarily be circumscribed. This fact is proved by analogy in the same body which contains the brain. The proper building up of a brain in all its functions and the aids to giving it abiding power are based on the same physiological law as that of training a race-horse or an athlete. It means not only development, but also endurance, especially by training in certain natural lines of production. It is not to be inferred from this that certain faculties are to be cultivated to the exclusion of others. This is done in the prize-giving stimulation of schools and colleges.

This system gives rewards to those who excel in one branch of study with a minimum of knowledge or capacity in any other. This leads to one-sidedness, while the rewards (if any) should be given to the best all round scholars, not ignoring natural aptitudes nor mental leanings toward certain lines of thought.

This would lead to moderate and multiform development, having regard to our diversities and idiosyncrasies. Education and instruction are different. The former means development of body and mind, while the latter means simply a mere knowledge of facts. A child may be full of facts and its education not begun. The neglect to consider this important physical law is leading to the generation of many of the nervous evils which now afflict the civilized races. At no time in the history of the world has education been more diffused among the common people, and at no period have nervousness, excitability, brain exhaustion, and insanity been so prevalent.

It is well to consider, if there exists any connection, and if so, how much, between national nervousness and forced education, between juvenile brain tension and adult brain debility. It may be we are discounting the future by forcing mental growth in the young beyond the natural capacity.

These are two entities whose relation seems to be largely forgotten in education. The architect of fate needs proper tools to do his work with. Education means the preparing and sorting these tools for the builder.

This mind organ is delicate, simple, and easily impressed. It can be operated upon, or it can be used as an instrument to evolve all mind action. In other words, it may receive impressions, or it may inherently manifest mental power. It may merely be filled with easily acquired knowledge, which may be the work of others, or it may give out its own energizing creations. In the former class of impressions it is only receptive, which is merely an appeal to memory ; in the latter is exercised in mental dynamics, and brings into being new ideas and native conceptions. To imbibe as a sponge gives no energy and no strength, but to grow as a tree gives power by virtue of the exercise of its increasing activity. Not only so, but this energizing entity increases the volume

and stability of the organ, as physical exercise increases muscular tone and fibre. Inertia means debility, for

“ Labor is life.

’Tis the still water faileth.”

On the other hand, early precocity mostly means adult enfeeblement. It is taxing the future by unduly straining the brain, from which it seldom recovers, and as a result we have a languid organ and a stunted intellect. Those who educate scout this idea, because their handiwork is best seen in forced effort and juvenile automatic memorizing. These prodigies of learning astonish trustees and parents and redound to the teachers’ credit. Those who teach believe that there is an unlimited capacity for thinking in all directions in every person. All the mental powers are pushed on all sides without respect to weak points. As a result, the reserves of nature are called upon at the expense of growth, brain nutrition, and the building-up processes. All minds put forth energies in one direction more than another. Here our individual differences come in. None of us are formed in the same mental mould. Even our potentialities vary, but are interdependent upon one another. They have a community of interests and draw resources from one another. This being the case, it is evident that the pushing forward of all the faculties at once, irrespective of natural bias and aptitudes, means a dwarfage of individual leaning because of the dissipation of reserve energies. Let me repeat. The educator looks at the mind development alone as evidence of his skill and assiduity. The physician looks upon both body and mind as objects of care, and endeavors to keep both under healthful conditions. The educator thinks that the mind in each individual has possibilities and potentialities almost unlimited if pushed to the test. The physician knows that each person has powers of growth and development beyond which such cannot go, by any amount of mental training. No forcing can go beyond the brain capacity, and that at its weakest point. This is especially true, when hereditary tendencies are taken into account. We have at our disposal only a certain amount of energy. It is transferable to some extent, and if used in one direction, it is lost in another. This law is seen in operation in animal life

as well as in mind phenomena. Exhausted muscular force means to some extent mental loss, violent emotion or sudden physical shock means in some degree muscular and organic enfeeblement. To a large extent this duality correlates with one another. This being the case, it is evident that undue forcing in any one direction affects the whole organism. The harmony of nature is disturbed by an unnatural distribution of energy. Another physiological axiom is that all bodily and mental energy needs a natural time to be utilized most effectively. Forcing always means great waste. To run a mile is more exhausting than to walk five miles. To do in an hour what should take ten hours, if continued, would mean utter prostration. To do in five years what should take ten years is equally disastrous to nerve power and mental health.

Many come out unscathed from this ordeal of overpressure, but if there are natural weaknesses, then is this rattling pace utter ruin to the racer. It means the consumption of stored-up power, which nature keeps on hand only for emergencies. Nature is a banker with wealth in store, but if left to itself it never draws upon the principal, as that means, in the future less interest, and if continued must end in bankruptcy.

The London *Lancet* of September 20th, 1884, says :

Life is played out before its meridian is reached, or the burden of responsibility is thrust upon the consciousness at a period when the mind cannot in the nature of things be competent to cope with its weight and attendant difficulties. All this has been said before. There is not a new word or a new thought in it, and yet it is a very terrible and pressing subject. We cannot give it the go-by. "Forced" education commenced too early in life and pressed on too fast is helping to make existence increasingly difficult. We are running the two-year colts in a crippling race, and ruining the stock. The underlying cause is impatience—social, domestic, and personal—of the period of preparation, which nature has ordained to stand on the threshold of life, but which the haste of "progress" treats as delay. It is not delay, but development, albeit this is a lesson which rash energy has yet to learn from sober science.

In mental training two objects should be kept in view. The one is to store the mind with the knowledge garnered by others, and the other is to strengthen the mind and to enable it to evolve out of its knowledge new ideas which are the

products of its own efforts. The earth absorbs and nothing more, but the plant both absorbs and assimilates and builds up. So it is with two classes of mind. We all have plenty of facts, but the discoverer has always found out additional ones in his own mental research ; hence his vantage ground over the mere copyist. He has crammed some, but he has evolved more. He has not merely memorized, he has also judged. The good memory is the means of carrying off all the prizes at competitive examinations, yet the best average mind will eclipse such in life's struggles for the mastery. There are, no doubt, a great many of our educated people who depend largely on remembered learning, and that many self-made men are distinguished by virtue of inherent power to originate. The great are not mere receptive machines ; they put their talents out to usury ; they are not merely recording instruments, but add to the common stock of knowledge by exploring new fields and by giving their experiences and discoveries to the world. Were it not for these pioneers we would still be floundering in the slough of barbarism.

It is self-evident that to merely cultivate memory is one thing and to evolve thinking is quite another. Cramming means mere remembrance, and may be indulged in with no more originality than are the chatterings of a parrot. This system carried to extremes gives mental dyspepsia, because there is not sufficient intellectual energy to assimilate the pabulum provided. Memory has its function, but to put mere recollection in the place of education is to dwarf all originality of thought for want of mental development. Each epoch of life should be left to do its own duties. The child, the youth, and the matured have laid out by nature unmistakable boundaries, which precocity should not be allowed to prematurely overstep. This encroachment is the bane of our present system of domestic and educational life. It is the popular fashion to endeavor to make, by forcing, men and women of mere children long before they reach the adolescent age. This hot-house mushroom growth means early decrepitude and decay of both body and mind. This law of growth is operating in all animated nature. The slowly growing tree is the hardiest. It takes deepest root, it has the toughest fibres, it grows heavenward the farthest, and in robustness

defies the storms of centuries. There is in all beings, possessing vital life, a certain proportion between the time a living creature comes to maturity and that of its natural decay. Some insects have a lifetime of birth, youth, maturity, and death in a day. The hen is old when the dog is young, the dog is old when the parrot is young, the parrot is old when the eagle is young, and the eagle is old when the elephant is young. Each according to its kind has a graduated scale of proportions in the different eras of life. Man is no exception to this rule. We may say a woman is fully matured at twenty-two years of age, and the man at twenty-five years. This general law of proportionate periods is seen in the brain. In this wonderful organ this physical law is in force, but not in the same periods as in other parts of our bodies. The brain comes to maturity on an average five years later than the body elsewhere, and therefore this mental instrument is comparatively younger than the other parts of the body, and, as a consequence, more tender and susceptible in youth than is the muscular system. The full-limbed and chubby-faced baby who squalls and kicks with vigor and eats enormously, as it performs gymnastics on its mother's lap, is the picture of physical health, but its feeble and semi-fluid brain grows slowly, as it is needed but little at this stage of automatic life. The brain gets behind in the race of life until the muscular system develops somewhat and thinking is needed for self-preservation. This conservation of brain force is a wise provision, when taken in conjunction with comparative growth and decay. It enables us to possess vigorous brains and strong minds, long after our knees are becoming weak ; our hands showing signs of shakiness ; our shoulders having a stoop in them, and we begin to gravitate bodily toward the earth from whence we sprang. As age creeps on, waste is getting the better of repair. In youth, there is not only a holding of the fort, but also an extension of its defences, hence the greater demand for building up material. The boy has to grow. Mental overstrain in youth and manhood is becoming a peril to the more civilized races. This malign influence of undue mind friction, and which begins in our schools, will have its full fruition in national deterioration and decay. Vice, lust, and moral corruption are largely found

among the mentally defective classes. The nervous, overstrung, over-tense brain in one generation means low mentally or ill-balanced minds in the next. This is nature's inexorable law. The only hope there is lies in the fact that the weakest goes to the wall. "The survival of the fittest" is no Utopian dream, nor scientists' unfounded dogma.

A fierce fight is kept up all along the line, and when the enemy breaks through there are no reserves to repel the attack, hence irretrievable ruin.

It is not well to run a machine up to its fullest tension; nor is it prudent to make a bridge with an arch only strong enough to support itself. The application is evident in reference to brain work and staying power.

To be a good, strong human animal, as well as a muscular Christian, is the substratal condition of national greatness and goodness.

In the palmy days of the Jews, the Grecians, the Macedonians, and Romans there were few weaklings. There was no mental cramming and few mind dethronements. There was little sentimentality about any class or condition when the interests of the State were paramount, and when the effeminate perished in the personal encounters of a rude warfare. The vigorous brain and powerful body were the most likely to survive, so by this sifting process a race of conquerors was produced. All the nations of antiquity fell in succession before more hardy foemen, but only when effeminacy and brain weakness had sapped the prowess of those conquered races. They were rotten at the core. Our day of decadence is surely coming through similar influences. We hide our defectives, our dements, and our pauper infirm in havens of refuge out of our sight. Had we not these retreats and all our mentally and physically afflicted were allowed to drift about in the community as in former times, these ever-present evils and evidences of national depreciation would frighten us. We would study more than we do the laws of health, and how best to develop and maintain moral, intellectual, and national supremacy.

Look at the ever-increasing demands for hospitals, asylums for insane and imbeciles, schools for feeble-minded, retreats for nervous complaints, almshouses for human wrecks, prisons for

chronic and congenital vagabonds, and then say if a vicious system of sanitation, of customs, of habits, and of education has not something to do with this state of things. This is not the Jeremiad of the pessimist ; rather it is the story of a danger signal to which we would do well to take heed.

The great restorer of brain power is profound sleep, and plenty of it to the school-going child. It stores the vital battery with mental energy. The child wants a dreamless forgetfulness to fully recuperate from its daily exhaustion. This is a physiological axiom.

It is also forgotten that much depends on the kind of exercise a scholar takes. Work of some kind is better than none, but it is not invigorating like play or some kind of amusement or enjoyment. These are mental tonics which have no equivalents. The boy will soon tire or weary sawing wood or weeding flower-beds ; but let him play fox and hounds, or football, and his energy is almost tireless. The girl sees no pleasure in practising on a piano at her lessons, or washing dishes in the kitchen, but let her dance from evening to morning, or roam the woods at a picnic, or go a boating, and her endurance is a matter of astonishment. Pleasure goes with the exercise, thus it is nature's stimulant and invigorator. When such boys and girls are approaching adolescence it is well to find out their natural bent of mind, and having done so, to lead the superabundant energy in the direction of well-liked and well-directed technical, professional, or mechanical pursuits. This is the critical time when a proper choice of occupation may mean pleasure in its pursuit, or a life-long drudgery in unnatural and unpalatable employment. Brain work is needful and healthful. It is a law of nature that activity is necessary to health, but it must be exercised in accordance with the laws of health. The twenty horse-engine must not be run with twenty-five horse power. This is violating rightful conditions. Over-pressure, undue anxiety, violent passion, worry without needful rest and fresh air, always mean a premature wearing out of the machine. A brain under such disadvantages will not live out half its days. To appreciate our danger in this respect let us look at our school studies. In some of the more advanced classes we find that from fifteen to eighteen studies are required in five days of

every week, not to speak of Sunday schools. Take school hours, and add to them, say two hours of evening or morning study, and we have for close mental application as many hours as are needed to do the daily work of a robust adult mechanic. To state this is to show the folly of our system of education, when exercised on the young and tender brains of the coming race. We forget that it is better to know everything of something than little of everything. The disgust for studies in adult years arises largely from our school work being forced upon us in nauseating doses, and also the choice of such as is uncongenial to our taste. Were I to formulate the prominent natural features of the mind which need education, I would say: Quality (tone), quantity (power), tension (endurance), variety (scope), control (habit). These are given to us as a legacy, and to no two alike, but proper training increases them to a wonderful degree, if guided with wisdom and discretion.

Education should be conducted somewhat as follows :

1. No teaching beyond object lessons up to six years of age.
2. Object lessons with reading and writing up to nine years of age.
3. Reading, writing, arithmetic in its four primary divisions and geography up to twelve years of age.
4. The preceding with history and primary arithmetic and grammar up to fifteen years.
5. From this age such studies as will assist the girl in feminine duties, and the boy to some definite employment or profession.
6. No studies in the evening until after fifteen years of age.
7. Three hours daily of school time up to nine years of age, four hours to twelve, and six hours until fifteen years of age.
8. After fifteen years of age studies to be intermingled with congenial and useful mechanical work. This to apply to both sexes.—*From the Journal of Insanity.*

BRAIN WORK—ESSENTIALS FOR ITS DEVELOPMENT AND HEALTH.

THERE is such a thing as mind-strengthening work. In truth, it is, as every physiologist knows, only by work

that minds, or more correctly speaking brains, can be strengthened in their growth and naturally developed. The exercise of those centres of the nervous system with whose function what we call consciousness and intellect are associated is as essential to their nutrition as activity is to the healthy growth of any other part of the organism, whether nervous or muscular. Every part of the living body is developed and enjoys vitality by the law which makes the appropriation of food dependent upon and commensurate with the amount of work it does. It feeds in proportion as it works, as truly as it works in proportion as it feeds. This canon of organic life is the foundation of those estimates which physiologists form when they compute the value of food in measures of weight-lifting power. It is, however, necessary to recognize, that although these propositions are true in the abstract, they need the introduction of a new integer or combining power before any sum of results can be worked out.

We know that food is practically just as truly outside the body after it has been eaten, digested, and even taken into the blood current as it is when it lies on the table. Nutrition is a tissue function, and its performance depends on the appetite and feeding power—which is something different from the organic *need*—of the tissue with which the nutrient fluid is brought into contact. Again, any particular part of the organism may be so exhausted by work that it has not power enough left to feed. It is a matter of the highest practical moment that this fact should be recognized. There is undoubtedly a point at which work ceases to be strengthening and becomes exhausting—self-exhausting and self-destructive so far as the particular issue in activity is concerned.

Work may be carried too far—in fact, to such a point that not only the last reserve of power for action, but the ultimate unit, so to say, of the force of nutrition, which is, as we now believe, identical with the force of general activity, may be expended in work, and the organism left so utterly powerless that its exhausted tissues can no longer appropriate the food supplied or placed within their normal reach. We have said that it is necessary that this should be understood. It has a special bearing on the question of brain work in childhood and adolescence.

Just as extreme weakness and faintness of the body as a

whole produce restlessness and loss of control, so extreme exhaustion of the brain produces mental agitation and loss of healthy self-consciousness. This is how and why the "over-worked" become deranged. One of the earliest indications or symptoms of brain exhaustion is irritability; then comes sleeplessness of the sort which seems to consist in inability to cease thinking either of a particular subject or things in general; next, the mental unrestful or uncontrollable thought gets the better of the will, even during the ordinary hours of wakefulness and activity, which is a step further toward the verge of insanity than the mere persistence of thought at the hour of sleep—this way lies madness; and, finally, the thinking faculty, or, as we say, the imagination gets the better of the will and asserts supremacy for its phantoms, those of sight or hearing being the most turbulent and dominant which happen to be most commonly used in intellectual work, and therefore most developed by the individual cerebrum—this is madness. Such is the story of overwork of the brain or mind, and it is easy to see that at any stage of the progress from bad to worse the will may be overpowered and the judgment perverted in such manner as to impel the victim of this mind trouble to seek refuge in death or to so disorder his consciousness that he supposes himself to be acting in obedience to some just and worthy behest when he commits an act of self-destruction or does something in the doing of which he accidentally dies. Such, in the main, is the story of suicide from overwork.

What, then, can be the excuse pleadable by those who heap on the brains of the young or adolescent such burdens of mind, labor, and worry as exhaust their very faculties of self-help and leave them a prey to the vagaries of a starved brain? We pity the suffering of those shipwrecked sailors who, after exposure in an open boat, perhaps without food for hours or days, "go mad," and, raving of feast and pleasures the antitheses of their actual experience, fall on each other or throw themselves overboard. Have we no pity for *brains* dying of lack of food because we have compelled them to expend their very last unit of force in work, and now they are distraught in the act of dying?

It may be a sublime ideal, that of a highly educated people;

but if it should happen that the realization of this beautiful dream of our philosophic reformers can only be achieved by the slaughter of the weak, it will scarcely console the national conscience to reflect that, after all, “the survival of the fittest” is the law of nature.—*The Lancet*.

“WOMEN WHO GO TO COLLEGE.”—Under this title Arthur Gilman writes in the September *Century*: “I have been told even in cultivated, intellectual circles, that a young woman had better be in the kitchen or laundry than in the laboratory or class-room of a college, ‘who should be trained,’ such persons say, ‘to be wives and mothers.’ The finger of scorn has been lightly pointed at the mentally cultivated mothers and daughters who are unable to cook and scrub, who cannot make a mince-pie or a plum-pudding. Such persons forget with surprising facility all the cases of women who neglect the kitchen to indulge in the love-sick sentimentality to which they have been trained; who think too much of possible matrimonial chances to endanger them by scrubbing, or by giving ground for the suspicion that they cultivate any other faculty than the power to apostrophize the moonlight and to long for a lover. They do not care to remember that it is no whit better to wither under the influence of ignorance or sentiment, to cultivate a fondness for ‘gush,’ than to dry up the sensibilities like a bookworm, or grow rigid and priggish as a pedant. It is as bad to stunt human nature as to over-stimulate it—to stop its progress in one way as in another. The danger is in going to extremes. The mass of men choose the golden mean, and we may trust woman to avoid extravagance in the pursuit of learning. We may and ought to give her every help in the direction of life that her brothers possess. It is no longer doubtful, it is plain, that whatever other rights woman should have, those of the intellectual kingdom ought to be hers fully and freely. She should be the judge herself of how far she should go in exploring the mysteries of nature and of science.”

SANITARY INSPECTORS AND THE IMPORTANCE OF THEIR SERVICE TO THE PUBLIC.

ABSTRACT OF ADDRESS TO THE ASSOCIATION OF SANITARY
INSPECTORS, NORTHWESTERN DISTRICT, LIVERPOOL, MAY
18TH, 1888, BY THE PRESIDENT, DR. ALFRED CARPENTER.

IT is curious to note the ignorance of the nominally educated public upon the nature of your duties. It is but too often supposed that it is simply a question of W.C.'s, of drain pipes, of cesspools, and slums, with which the so-called better class of people have nothing to do. The cook and the kitchenmaid have to see that the dust-men do their work, and if that is done and the W.C.'s of the house don't smell, the public think they have done their part in the matter, and they relegate the sanitary inspectors and their assistants to obscurity and sometimes unsatisfactory neglect.

I want to show the outside public, if they will listen to me, that there is something much higher in sanitary work than the points I have mentioned. That unsavory subjects may be put aside, but if their condition is not supervised by intelligent men who understand what they are about, it is the public who suffer most, and that but too often in ignorance of the true reason for their suffering. Sanitary inspectors' duties may be mainly in the slums; they may be at work in the supervision of dust-bins, of sewers, of cellar dwellings, of slaughter-houses and knacker's yards, of food markets and refuse heaps in out-of-the-way places, but if their work is only half done, if they only comply with the letter and do not enter into the spirit of their work, the effect of their perfunctory performance may make itself felt when least expected and in ways which cannot be brought home directly to the delinquent and neglectful people.

It is not only by the removal of epidemic and infectious disease that a locality benefits by sanitary inspection. There may be a complete absence of the disease germ upon which

typhoid or small-pox depends. There may be no scarlatina in the district and the so-called zymotic death-rate may be low, and yet the health of the district may be most unsatisfactory. It is too much the custom to study what is called the zymotic death-rate, and to judge from that factor as to the general health of a given district, and it is often assumed that because that form of disease is not so fatal as in other places, therefore, the sanitary state of that district is satisfactory. This is a serious mistake. I want the public to become aware of this, and to recognize the fact that sanitary work can go much farther in the prevention of disease and death than this. Why should men, women, and children die of disease at all? There is no provision for death in early life except by accident, ignorance of the laws of health, and neglect of duty toward our neighbor on the part of somebody. Accidents may be reduced to a minimum, as is shown by the effect of responsibility in this direction upon railway companies—only thirty-seven deaths have been caused on railways in the whole of the kingdom during the past year, a tithe only of those which happen in the streets of Liverpool. Would they have been so limited if it had not been for the law of responsibility? No doubt accident may be entirely prevented by proper regulation and by throwing the legal responsibility of result upon those who cause it. The duty toward our neighbor is being learned by local authorities by the agency of sanitary inspectors; and legal responsibility again is coming to the assistance of public health by making owners responsible for consequences when they let a house in an infected or unsanitary condition to an unsuspecting tenant. We want an extension of this legal responsibility which shall apply to corporations as well as to single landlords, so that when a corporation supplies an infected water to their customers, or neglects to enforce some of the laws of health, the rules for the enforcement of which are placed in their keeping, but which are not enforced, that they should be equally responsible for the results when it can be brought home to them, as failing in their duty upon the points in question. The ignorance upon the laws of health among the masses can only be counteracted by healthy education, and it is here that the assistance of the sanitary inspector is especially useful. If

the house is dirty, if the ceilings of the homes of the people are blackened, if they leave their floors in a filthy state, and their back yards polluted with ordure, you can give a clinical lecture upon the evil results of such states and assist the people to the knowledge that "Cleanliness is next to Godliness" and that a good supply of pure water is far more to their advantage than the near neighborhood of the public house. You, of all men, know that the nearer a working-man's home is to the gin shop, the dirtier is the dwelling, and the unwholesomeness of the atmosphere of the district will be measured by the number of drink shops which may occupy a given area.

You, with the ministers of religion, and the doctors have especially brought to your knowledge the evils of intemperance and its close relationship to disease and death, and how the excess of drink shops raises the death-rate of a town.

I have said that sanitary practice is of much greater benefit than simply preventing epidemic diseases. I will explain my meaning. Let us take fifty cases of inflammation of the lungs, or of bronchitis, or of scarlatina—this latter the result of infection. Why do some die and some recover? Why should disease be fatal at all? Fatality is connected to some extent with the surroundings in which the patient has lived before he became affected and is living at the time at which the disease commences in a given district. If there has been a large number of fatal cases of inflammation of the lungs, you may be certain that the air of that district is not so pure as it ought to be and the habits of the inhabitants are not so prudent as they might be. No man dies of inflammation of the lungs in middle life, or, indeed, of any acute disease, be what it may, if he has lived healthily both as to habits and character of surroundings. If a district has a death-rate of 24 in the 1000, it is double what it ought to be. The half of the deaths which take place might have been prevented if the people would obey the laws of health, keep their houses and their persons clean, dispose of their excreta in a proper way, and be temperate in their habits of living, and at the same time do their duty to their neighbor by avoiding the sophistication of articles of diet, or indulging in the mischief of adulteration for the sake of the riches which follow upon its pur-

suit. The evidence which is forthcoming in support of these views is such as must carry conviction in the long run to the minds of the British people, and must lead them to punish adulteration, to put further impediments in the way of the liquor traffic, to insist upon property owners fulfilling their duties and accepting their responsibility, as well as taking the interest upon their capital, and lastly in compelling local authorities to appoint officials to do their work who really know how to fulfil the duties they undertake to perform, and give them instructions to carry out that work without fear or favor.

This brings me back to the object of our meeting—viz., the combination you have entered into for the promotion of your own sanitary education and for the purpose of pressing this view of your position upon local authorities in general—viz., that in the future there should be some mark by which they may know the educated sanitary inspector from the impostor and the quack.

The statistics of Dr. W. Farr, supported as they have been by the researches of my colleague and teacher, the veteran sanitarian of East Sheen—I mean Edwin Chadwick, who, like to Mordecai of old, is as yet unrecognized by the powers that be, show that the value of a human being's life to the State is upward of one hundred and fifty pounds. Edwin Chadwick is daily striving to bring the eye of public opinion to bear upon "the errors of local administration" and the mischief of neglect. But little attention, however, is paid to his warnings, for they grate somewhat upon the ears of political antagonists, and it is not always expedient to publicly recognize them. Like as the sanitary unit is the sanitary condition of the individual house, and the habits of the individual tend to account for his state of health; so the sanitary condition of the country generally must depend upon the sanitary state of the parish. There may be good men at headquarters, but if the agents by whom they have to carry out their work in the parishes are inefficient, the result of the work done cannot be satisfactory. The healthiness of the extreme twigs, upon which the sanitary tree depends for its development and growth, must affect the growth and the development of the trunk of the tree; if, therefore, the sanitary inspectors are not healthy and right, the whole growth is unsound.

I will conclude in the words of Chadwick, as given in his address on the 5th of this month, at the Westminster Town Hall: "It is our duty to endeavor to replace poverty by competency, nastiness by comfort, brutishness by education, shortness of life by length of days, and that health which brings, naturally, not only a long life for each member of the human family, but happiness in which to enjoy it. No men among men have a nobler task than this—than ours."

RISK OF TRAVEL.

THE reported indisposition of the Duke of Edinburgh from drinking impure water at a foreign station gives prominence to what is, perhaps, the most usual and frequent source of danger in foreign and Continental travel. Many of the sanitary authorities who have looked into the question have from time to time uttered warnings to Continental travellers as to the dangers of the ordinary drinking water to be found abroad. The pollution of table-water at foreign hotels and houses is due to a great variety of causes. The water-supply of foreign cities is, as a rule, to which there is only a few exceptions, taken from sources lamentably liable to sewer pollution, either in open streams or uncovered reservoirs, or from defective sanitation in the house-supply. A large part of the domestic supply of drinking water is, moreover, from surface wells, which are constantly liable to sewerage filtration. An examination made only a few years since, of syphons of sparkling "seltzer" in a great Continental city, disclosed the fact that they were horribly polluted with sewage, and that the effervescing fixed air with which they were charged only served to conceal unutterable contaminations of a most dangerous kind. Sir Henry Thompson and Dr. Herman Weber, who have both given attention to the subject, are very emphatic in their counsel to travellers to avoid ordinary drinking water abroad. The easiest and most agreeable means of avoiding the danger is the habitual use of a pure natural mineral water in lieu of the doubtful drinking water of hotel or private house. When the Prince of Wales went to India he took with him a large supply of the kind, and successfully

avoided this risk. Another method in which safety is sought is by invariably boiling the water before drinking it. This, however, involves more trouble than many people are willing to take, and makes the table-water flat and insipid. This insipidity may be relieved by squeezing fresh lemons into the water. But for those who cannot always be bothered with the boiling-pot or troubled with performing this little domestic operation before taking a draught of drinking water, it would be wise when travelling abroad to select as a table-water a natural mineral water of undoubted purity rather than run the risk of blood-poisoning, typhoid, and diarrhœa, to which so considerable a number of travellers at present fall victims, finding death and disease where they were seeking health and pleasure. The instances of typhoid, blood-poisoning, diarrhœa, and dysentery, of which we hear this year from Italy and Egypt, are very lamentable and for the most part avoidable. —*British Medical Journal.*

THE WATER-SUPPLY OF SUMMER RESORTS.—Dr. Cyrus Edson, of New York, chief inspector of contagious diseases, in a recent interview is reported to have said :

“The water-supply of the summer resorts in this country is almost invariably as bad as can be. The most attractive watering-place is often but a dangerous guest trap baited with alluring scenery, fresh air, fishing, boating, and other things attractive to its game of gathering the young and old that it may wreak its ills upon them. During the months of June and July I visited eight popular resorts. All were on the sea-coast, and were situated in villages or consisted of congregations of cottages. All were supplied with water from dug or driven wells in depth about twenty feet. The drainage was uncared for, so far as preventing contamination of the wells was concerned. At one place—the only one where a sojourn of ten days was made—nearly all the guests were found suffering from diarrhœa of more or less severity. What would be the consequences, think you, if a few cholera bacilli should find their way into towns such as this? The unacclimated, or rather the unacquainted, visitor from the city, after a few days in such a town wonders ‘what ails his bowels.’ It is not much of a mystery to experts or diagnosticians.”

CHOLERA AND QUARANTINE.

ABSTRACT OF REPORT ON THE NATURE, CAUSES, AND PREVENTION OF CHOLERA.

By S. P. WISE, M.D., Millersburg, O., Chairman of the Committee on Epidemic and Endemic Diseases and Quarantine, Ohio State Board of Health.

IF we assume that the contagion of cholera consists of a microbe or germ, which is communicated from person to person, and is transported from one locality to other localities, and from one hemisphere to another by means of human agency, it is self-evident that measures which restrain or inhibit commercial or social intercourse between different nations and localities must be of infinite importance. Let the soil be ever so favorable for the propagation of the disease, if the germ does not gain access to it the disease will never be engendered. It, therefore, behooves the sanitarian to make a thorough study of the subject of quarantine in all its relations, and carefully estimate the value and importance of the various regulations and restrictions that have been adopted, in order that he may eliminate truth from error and be able to judge of their efficiency or non-efficiency. The necessity of quarantine restrictions was recognized in the days of the ancient Jews, as will be observed by the following passage of Scripture, Lev. 13 : 46 : " All the days wherein the plague shall be in him he shall be defiled ; he is unclean ; he shall dwell alone ; without the camp shall his habitation be."

In early days, when scarcely the rudiments of sanitary science were understood, and contagion and infection were little comprehended, the quarantine laws required a detention of vessels for a period of forty days, as is indicated by the literal meaning of the term. Later on this time was limited to thirty days after the last exposure. The detention of vessels

for such a period was a great embarrassment to commerce, and was as good a plan as could have been devised to perpetuate the disease among the passengers and crew. Under the light of accumulated experience these oppressive restrictions, based upon erroneous notions of the laws of contagion and infection, have been abrogated. The rules for the contravention of the disease that are now enforced are based upon the period of incubation of the disease and its mode of transmission. Vessels are detained only for a sufficient length of time to undergo thorough cleansing and disinfection, and those passengers who are sick are isolated, while those who are well, but possibly infected, are secluded and placed under observation for a length of time equal to the outside limits of the incubative period of the disease. It will be, therefore, noted that the signification of the word quarantine as applied to-day is by no means what it was formerly. Instead of merely a forty days' restriction, it now comprises the whole series of precautionary measures, restrictive as well as hygienic, that are employed in preventing the incursion and spread of an epidemic. Nor is it limited to the precautions that are taken at the port of arrival, but also includes the inspection of passengers and their effects at the point of embarkation. Quarantine, in its application to the prevention and restriction of cholera, is undoubtedly one of the most difficult problems that has engaged the attention of sanitarians. The experiences in different epidemics have differed so widely as to leave great room for diversity of opinion in respect to the efficacy of protective measures. The non-contagionists who attribute the spread of the disease to some obscure atmospheric condition, producing a so-called cholera wave, assert that it is a delusion and a snare for us to trust our safety to such inefficient protection as is afforded by quarantine measures; that they are simply sentinels on the outposts who warn us of the approach of the enemy. The advocates of this theory fully recognize that cholera has its home in India; that the large aggregations of people, with the attendant conditions—filth, poor food, exposure, etc.—are the potent factors in its propagation; but that, notwithstanding these elements, how can we account for the fact that it is only at certain times that it extends itself beyond its confines and becomes a widespread

epidemic? In proof of the utter inutility of quarantine, they refer to the late experience in Egypt, France, and Italy, and point with derision to the numerous instances where it has failed in intercepting the progress of the disease or in curtailing its area of destruction. They compliment the Academy of Medicine in Paris on the wisdom of their action, when they condemned the energetic and decisive measures that were adopted, and declared that cholera could not be stayed or limited. It is true that these arguments appear unanswerable and most difficult to refute; and we must admit that the cause of the periodic spread of cholera is mysterious and totally beyond our comprehension, except it be due to such occult atmospheric influence. It seems to me, however, that the truth lies in the happy medium, and those who harmonize the apparent contradictions, combining the theory of human portability with atmospheric agency as a "plus condition" beyond the microbe or bacillus, have obtained the nearest approach to the truth. I believe that atmospheric influence bears the same relation to an epidemic of cholera as sunshine and rain do to the growth and ripening of vegetation. Without these essential elements, the growth must fall short of maturity; but if they are present, and the seed is sown, and the soil is favorable, it will spring into rich luxuriance. A thorough review of the history of quarantine in its application to the prevention of cholera will convince any one that its failures have almost invariably been due to carelessness or lack of promptness in the enforcement of its minor details. A careful consideration of the facts will show clearly that in each instance where the disease was not stayed in its progress, there were some attendant circumstances which rendered quarantine restrictions impracticable, or else the proper efforts were not made to enforce its measures rigidly. There is no apparent reason why maritime quarantine, executed with a proper degree of vigilance, should ever fail in stamping out the disease, especially since the discovery of potent germicides and the improved scientific methods of their application. In the case of land quarantine, however, we cannot expect such positive results, although its alleged inutility arises from the fact that, in the majority of instances, precautionary measures were not adopted until the disease had gained

an uncontrollable foothold. It is self-evident that whatever is to be accomplished in preventing an epidemic must be done at the earliest possible moment, when the afflicted are few in number and the infection is circumscribed in its limits. As before stated, the mass of the inhabitants of Damietta had fled before a rigid quarantine was established in Egypt; and on investigation, it was found that deaths from cholera had occurred during the month of May; whereas, none had been reported until June 21st. In many of the Egyptian towns the barbers, who shave and prepare the dead, are the first registrars of vital statistics. The principal barber of Damietta was among the first to die of the disease; hence, the records of the earliest deaths were all lost, and the fatal cases of infective diarrhoea were never recorded. During the first three weeks of the epidemic at Marseilles it was estimated that over one hundred thousand persons left the city and scattered all over France, Italy, and Switzerland. The entire community was in a state of uncontrollable frenzy, and fear seemed to madden the entire population. Naturally, those who lived in the immediate vicinity where the disease broke out were the first to take their departure, and many of them carried the contagion with them. The disease was thus spread throughout the whole district, within a radius of one hundred and fifty miles of Marseilles. We can readily imagine that it would be utterly impossible to stay such a powerful current of terror-stricken people; even a sanitary cordon would be ineffectual, except in those localities where the population is limited and the ways of communication are few and easily guarded. The manner and means by which cholera was transmitted to Italy is a strong illustration of the criminal recklessness with which quarantine regulations are oftentimes conducted. At the outbreak of the disease in France, Spezia was selected by the Italian Government as a quarantine station, where all Italian fugitives were detained who had fled from the stricken French cities. Those who were unable to pay were brought back to their native land by Government vessels, and were held on board of ship till the days of quarantine had expired. Many hundreds of those refugees were picked up along the French coast and brought home. After their days of quarantine were passed they were

allowed to go ashore and take their mattresses, bedding, and personal effects with them. It is reported that many of them sold their infected stuff to the highest bidder. Some of those fugitives escaped ashore during the night and took their clothing and bedding with them, and wandered wherever they chose.

Genoa had the disease introduced by means of its drinking water. The water of the Nicolay Aqueduct, which is supplied by the river Scrivia, had undoubtedly been contaminated by choleraic discharges. Near the head of this aqueduct, at a village called Busalla, from fifteen hundred to two thousand laborers were engaged in excavating a new railroad track. Cholera broke out among them, and before it was discovered by the authorities fourteen of them had died. Inquiry disclosed the fact that many of those laborers were fugitives from Marseilles, and that nearly all, both sick and well, had been washing their clothes in the river which supplies the aqueduct. This explained the singular circumstance that the early victims of cholera were found scattered all over the city, wherever the water was used. Another noteworthy fact is, that before this water-supply was shut off, the fatality was enormous—two hundred and seventy-five out of three hundred cases died, and all of them had been drinking this water.

The methods of fumigation and disinfection that were adopted at railroad stations throughout France and Italy were also very inefficient, and even worse than useless, because those who had complied with the regulation fancied themselves secure, when, in fact, the protection amounted to nothing. On the arrival of trains at one of these stations, all baggage was surrendered and left for fumigation outside of the station for two hours. The passengers were then hurried into large rooms, in the corners of which earthen dishes were placed, in which the fumes of chlorine were generated. They were kept exposed to these fumes for a period of seven minutes, after which they were permitted to resume their journey. In the morning these fumes were strong, but grew less during the day, but at no time were they of sufficient strength to destroy the cholera germ. Moreover, it is evident that in order to be effectual in destroying the contagion, the vapor of chlorine or sulphur should be brought to a degree of intensity that would prove destructive to human life.

The foregoing brief description of the careless manner in which quarantine regulations were administered, and the inadequate methods that were employed in the prevention of cholera in Europe, fully corroborate the statements hitherto made in reference to the inefficiency of quarantine—namely, that in the majority of instances where it was unsuccessful in intercepting the progress of the disease, the cause of such failure is traceable to carelessness or incompleteness in the administration of its measures. It is, therefore, obvious that its alleged inefficiency does not detract whatever from the scientific principles involved. Those who deprecate the principles of quarantine might, with equal propriety, denounce the practice of roofing houses because some roofs leak. If a roof leaks, there is some fault in its construction, or else in the material of which it is composed ; so likewise with quarantine ; if the disease passes through it there must be some defect in its organization or some point in its line of defence is not microbe-proof.

We need not, however, limit our deductions to negative evidence in proof of the value of quarantine, as the history of epidemics in the past furnishes abundant illustrations of most positive results that have thereby been attained. During the epidemic in Marseilles and Toulon the most rigid and exacting quarantine was established at Lyons and Paris, on those railroads which communicated with the infected cities. All passengers, baggage, and freight, as well as cars, were fumigated and disinfected and subjected to the strictest surveillance. The result was that the disease was not transmitted to either of those cities, although the sanitary and hygienic precautions were also rigidly enforced, and no fruits or vegetables from infected districts were admitted. Most all nations had imposed a quarantine upon vessels from the infected ports ; but Ottoman ports absolutely refused entry to such vessels upon any and all conditions. In consequence of these stringent measures, Turkey escaped the disease that year, which was unusual in its history prior to the year 1883. It is a well-known fact that whenever cholera prevailed in Europe or Egypt it has always later appeared in Constantinople. The sanitary condition of that city was extremely bad in 1883, and yet the disease did not make its appearance, neither in that

year nor thereafter, in spite of the fact that it travelled along the shores of the Mediterranean and numbered thousands among its victims. A satisfactory explanation for this immunity can be derived from the following circumstances : The belief has always prevailed in Turkey that all plagues are scourges sent by the Almighty to punish human creatures. Therefore, it would be an offence against Providence to make any effort to prevent this punishment. They, of course, always kept up a show of quarantine in order to distract the attention of European nations ; but, in fact, the precautions that were taken were merely farcical. The present Sultan, however, entertains entirely different views from his predecessors. He believes that God sends storms, plagues, and earthquakes, but that He also sends all insects ; hence, he reasons that if we exterminate the latter, why should we not do all in our power to ward off the former. Therefore, he established and maintained a strict quarantine, and placed his palace in telegraphic communication with the quarantine station, and, in every way, rendered the service as efficient as possible. He exacted the strictest compliance with all the rules and regulations, and punished severely those who violated the health laws.

Palermo was not stricken by cholera in 1884. It is quite apparent why she escaped, when the fact is known that shortly after the outbreak in France the official order was issued that no vessels whatever should be allowed to enter ports in Sicily until cholera had fully subsided, and only special permission was granted to certain persons to return home from places in Italy not infected. These same rigorous measures were adopted at the time of the epidemics of 1865 and 1873, with the same satisfactory results. Whereas, in 1866, when cholera prevailed in Naples, the disease was brought to Palermo by insurrectionists, who broke the quarantine and entered the city, immediately after which the disease broke out and created havoc among the inhabitants.

It has been urged as an argument against quarantine that England, Belgium, Germany, Switzerland, and other Eastern countries, which had taken no special quarantine precautions, remained free from the disease, while Italy, with its sanitary cordons and all its extreme measures, was not able to ward it

off. A brief glance at the situation and the relations existing between these two countries will show plainly why this was so. It must be remembered that at the time of the cholera epidemic in France over three hundred thousand Italian laborers were employed in the southern part of France, a short distance from the Italian frontier. Ten thousand of these laborers were at work on the fortifications of Toulon. When work was suspended on account of the epidemic, the Italian Government was obliged to provide for its subjects, which they did by furnishing them free transportation to their homes. From the time quarantine was established on the Italian frontier up to August 10th of that year over thirty thousand persons passed through the quarantine stations—twenty thousand at Government expense. In the early period of the epidemic persons were allowed to pass through quarantine with the clothing they had worn in the infected districts, and were subjected to fumigation only. There is no doubt but that the contagion was thus brought into Italy.

When we take a comprehensive view of the cholera question, and reflect upon the causes of its propagation and the source of its origin, India stands forth prominently as a colossal nuisance among the nations of the earth, the toleration of which constitutes the most flagrant outrage upon the human race that has ever existed since the beginning of the world. Nor can we overlook or refrain from commenting upon England's responsibility in maintaining this monstrous "germ incubator," to the great detriment of all other nations and the enormous destruction of human lives. India is now regarded as an integral part of the British Empire, and the home Government controls the great channels of commerce through which cholera has usually been transmitted to Europe. She also furnishes the majority of the steamers which are annually engaged in transporting Mohammedan pilgrims to Mecca. It is therefore evident that the position she occupies in the prevention of cholera epidemics is one which imposes the gravest responsibility and demands the adoption of the most stringent and exacting precautionary measures that can possibly be instituted. Instead, however, of establishing and aiding in the maintenance of efficient quarantine regulations, she has constantly shown an intolerant disposition toward any

measures which placed the slightest restraint upon her commerce. Owing to the extent and importance of her commercial interests with India, she has in every way evaded and attempted to thwart the quarantine regulations adopted by the International Sanitary Council. This has been done not only through the action of her Government, which protests against the necessary obstruction to its commerce which the observance of those rules entail, but also her medical literature strongly advocates the doctrine that cholera is not contagious, and denounces all repressive measures. We cannot fail to note the striking contrast between England and France in regard to activity and efficiency in the administration of quarantine. France, owing to her geographical position and climatic condition, has had extensive experience in dealing with epidemics, and has largely profited thereby, so that her sanitarians have acquired great knowledge and forethought in matters pertaining to the invasion of pestilential diseases; and it is said that whatever provisions have been made against the invasion of cholera by the International Sanitary Council have been almost exclusively suggested and formulated by French sanitarians.

The all-important question, as to what the United States maritime quarantine system consists of, and whether it is entitled to our implicit confidence in the present perilous situation of our country, has recently been extensively discussed in our sanitary conventions and largely commented upon by our most eminent writers. While the statements in regard to its efficiency are somewhat conflicting and adverse opinions have been expressed even by the same person on different occasions, yet the great mass of testimony shows conclusively that our quarantine defences, outside of New Orleans, are totally inadequate, and in order to render them thoroughly protective, the entire system should be reorganized and placed upon a more efficient basis. Their inefficiency is not attributable to the personnel of the service, who in most instances are thoroughly competent and discharge their duties to the utmost of their ability, as far as inferior equipments and appliances and the limited means at their command enables them; but the fault lies with the system itself, which is controlled by political and other damaging influences, and

is often "hampered by a vicious financial policy." In view of these facts, it is highly probable that, owing to these vitiating influences, State quarantine is a failure and can never be elevated to the high standard of efficiency that is demanded by the advanced state of sanitary science. It is therefore strongly advocated by sanitarians generally that our maritime quarantine should be placed under national control and supervision. Since contagious disease, introduced through one of our ports, is liable to extend to a number of States, or throughout the entire country, and thus become a national scourge, and as even States who escape the disease cannot fail to suffer an incalculable pecuniary loss in their commercial relations, it would therefore be eminently right and proper that the means of protection against such a national calamity should be furnished, provided for, and administered by the general Government. There certainly could be no reasonable objection to national quarantine, especially on the part of States which have maritime ports, and are compelled to bear the responsibility and expense incident to a quarantine service, whereby the whole nation is protected. The question of State rights has heretofore created considerable acrimonious dispute, and while the matter may be definitely settled politically and the obligations of States to the general Government and to one another may be clearly defined, yet it can hardly be expected that a State would consider the interests of another when its own welfare is at stake. The medical profession and sanitarians of our country should make a united effort to bring this matter to the attention of our present Congress. Our representatives in that body should be cognizant of the fact that the grave responsibility is resting upon them of protecting our nation against the invasion of an epidemic which may devastate a great portion of our country and ruin its prosperity for years to come. They should not be unmindful of the fact that they are the guardians of the lives and health of their constituents as well as their political representatives; and while they are wrangling over the tariff laws and cudgelling their brains how to dispose of an overflowing treasury, they may be tolerating absolute "free trade" on cholera germs, and the omission of adequate protection may cost the lives of thousands of our

citizens and millions of money. In the cholera epidemic of 1884 and 1885 France, Spain, and Italy lost two hundred and twenty thousand out of six hundred thousand attacked, and the financial loss exceeded twenty millions pounds sterling. It may be confidently predicted that the time is not far distant when the responsibility of nations in communicating contagious diseases to others will be fully recognized, and the sending forth of emigrants from an infected district to a friendly nation will be considered as much an act of hostility as any other aggressive warlike demonstration. The rigorous measures which have been adopted by some of the European seaport cities are certainly worthy of imitation and would be perfectly justifiable. No vessel from infected cities should be allowed to enter our ports, and all communication should be suspended until the disease is positively known to have subsided. If, however, so strict a measure should be deemed unnecessary, at least rags and all fabrics and articles of merchandise which are difficult of disinfection should be absolutely excluded. It has always been difficult for me to conceive it possible for the fumes of a disinfectant of the greatest density to penetrate rags, woollens, and similar fabrics to a sufficient degree as to destroy all disease germs that may be contained therein, even if the packages are opened and the goods exposed for the usual length of time ; and I would venture the assertion, that those who believe in the sufficiency of this procedure would hesitate to wear or possess goods which they knew to have been transported by an infected vessel. A cursory perusal of foreign reports has led me to the conclusion that a decided improvement might be made in our consular system. For instance, I observe from the report of the American Consul at Marseilles that the epidemic of cholera had raged in that city for a period of two weeks and the death-rate had attained the highest number of seventy per day before the Department of State ordered him to employ a competent physician to examine vessels which cleared that port for the United States. The criminal carelessness of such delayed official action is apparent without comment. Moreover, it would seem highly necessary that a competent medical inspector should be permanently connected with every seaport consulate, who should be required to make

a thorough inspection of every vessel bound for the United States, and this should be done with reference to all infectious diseases, whether an epidemic is prevailing or not. In order that the greatest zeal and fidelity to our country may be secured, those inspectors should be American citizens of recognized ability as physicians and sanitarians.

DEATH AND BURIAL IN CHINA.—Infants are buried summarily, without coffins, and the young are interred with few rites ; but the funerals of the aged, of both sexes, are elaborate in proportion to the number of the descendants and to their wealth. When a childless married man dies, his widow may perform all the duties of a son toward him, may remain in his house, and may adopt children to rear as his heirs and as worshippers of the family manes. If his widow purposes marrying again, a young male relative may, with the consent of senior members of the clan, undertake the services expected from a son, and may inherit the estate of the deceased.

When one is about to die, he is removed from his couch to a bench or to a mat on the floor, because of a belief that he who dies in bed will carry the bedstead as a burden into the other world. He is washed in a new pot, in warm water in which a bundle of incense-sticks is merged. After the washing, the pot and the water are thrown away together. He is then arrayed in a full suit of new clothing, that he may appear in hades at his best. He breathes his last in the main room, before the largest door of the house, that the departing soul may easily find its way out into the air. A sheet of spirit-money, brown paper having a patch of gilding on one surface, is laid over the upturned face, because it is said that, if the eyes are left uncovered, the corpse may count the rows of tiles in the roof, and that in such case the family could never build a more spacious domicile.—From "*Some Chinese Mortuary Customs*," by ADELE M. FIELDE, in the "*Popular Science Monthly*" for September.

SEWER-AIR DISEASES.

A GREAT deal of vague assertion has been made with regard to the effects of sewer gas, or, as it is better called, sewer air, upon the human system. While some look upon it as always poisonous and often virulent, others consider it usually harmless, though unpleasant. The good health of workmen engaged constantly upon sewers is cited in favor of this latter view.

Dr. Elias H. Bartley attempts, in a recent volume of Wood's "Reference Handbook," to treat the matter systematically, and he has made a very satisfactory contribution to a little understood, though much discussed, subject.

Sewer air is defined as including the air of house drain-pipes, privy vaults, cesspools, and other imperfectly ventilated places containing decomposing animal and vegetable matters.

The composition of badly-ventilated sewers, according to Professor W. R. Nichols, of Boston, is :

	Maximum.	Minimum.
Oxygen.....	29.90	20.48
Nitrogen.....	79.26	78.89
Carbon dioxide.....	0.50	0.40
Sulphuretted hydrogen.....	trace.	trace.

In extreme cases the oxygen has been found as low as 13.79 per cent, the carbon dioxide as high as 3.4, and sulphuretted hydrogen as high as 2.90 per cent. Besides the gases here mentioned sewer air always contains bacteria and volatile organic matters, sometimes in large amount. The exact nature of these organic matters is not well understood. Some of them seem to belong to the class of bodies known as compound ammonias, or amines. The gases making up sewer air possess considerable diffusive power, and will pass easily through walls and porous earthenware or brick sewers. In this way these gases frequently find their way into the cellars of houses, especially in the vicinity of a broken sewer or im-

properly constructed cesspool. Fungi readily grow in such air, and articles of food, such as meat or milk, soon become tainted and decompose when exposed to it. Experience has shown that stagnant sewage gives off more gas and is more dangerous than that which is kept in motion. Sewer drains which have a steep grade are, therefore, to be preferred to those having a slight grade. Where sewers are frequently flushed with water, and where there is no chance for stagnation, with a reasonably good ventilation, the danger from sewer air is reduced to a minimum.

There are very strong reasons for believing that the specific poisons, or germs, of a number of the contagious diseases may be transmitted by sewer air. Dysentery, diarrhœa, the periodic fevers, typhoid, cholera, and yellow-fever are among the diseases which may be conveyed by sewer air.

Acute poisoning by sewer air is comparatively rare, and when it occurs is due generally to the H_2S , or to absence of oxygen.

The symptoms of chronic sewer-air poisoning are of two kinds: the specific and the non-specific. The specific symptoms are those which result from pathogenic micro-organisms of various kinds suspended in the sewer air and causing the various infectious diseases described.

Among the symptoms, when no specific disease germs are at work, are malaise, headache, loss of appetite, with dyspeptic symptoms, drowsiness, and slight feverishness. There is a marked tendency to anæmia and general debility. These symptoms are frequently grouped under the name of "malaria." In children, to these phenomena may be added a smooth or glazed, broad, flabby tongue, with a marked tendency to digestive trouble, as vomiting, diarrhœa, dysentery, and attacks of gastric catarrh and catarrhal tonsillitis.

The tendency of sewer-air poisoning is to derange the organs of primary assimilation rather than the lungs; as, for example, gastric catarrh, duodenitis, hepatitis, splenitis, diarrhœa, enteritis, and colitis. Besides these effects, the debilitating influences of the polluted air render the persons so affected an easy prey to an intercurrent malady. Sewer air is more likely to affect weakly and anæmic persons.

The treatment of chronic sewer-air poisoning is to remove

the cause, secure a change of air, and use tonics and symptomatic remedies. The best specific is fresh air.

The methods of detecting sewer air vary somewhat. The chemical tests depend upon the detection of sulphuretted hydrogen (H_2S) or ammonium sulphhydrate. If a piece of filter paper be dipped in a solution of lead acetate, and be exposed to an atmosphere containing either of these substances, it turns dark brown, and finally black. A paper dipped in a solution of nitro-prusside of sodium assumes a crimson, and turmeric paper a brown color with ammonium sulphhydrate. White-lead paint is darkened by both the above compounds, while zinc white is not changed in color.

The peculiar odor of H_2S may be easily detected when the proportion reaches one part in ten thousand of air. On closing a room tightly for some hours and then going into it from the open air, a musty or oppressive odor is detected when sewer-air emanations from decomposing animal matters have found their way into it. If any circumstance should lead to the suspicion that sewer gas is entering a room or house, it would be best to test the drain-pipes by the "smoke test" or the "oil-of-peppermint test."

A suspected joint in a sewer or drain pipe may be tested by wrapping it with a single layer of white muslin, moistened with a solution of acetate of lead. As the gas escapes through the meshes of the cloth, it will be blackened by the sulphur compounds.—*The Medical Record.*

THE PROCESS OF PURIFYING SEWAGE BY PASSING THROUGH IT CURRENTS OF ELECTRICITY has been patented by William Webster in England. The effect of the current, it is said, is to cause the solid particles held in suspension in the sewage to collect at the surface of the fluid within a few minutes. It is estimated by the inventor that the cost of treating the London sewage by this plan would be about \$125,000 a year. The chemical method, if adopted, would involve an annual expenditure of about \$150,000, the electrical plan being therefore the more economical of the two. Results of experiments on a larger scale will be awaited with much interest.

THE AERATION OF WATER-SUPPLIES BY NATURAL CANALS AND LOW DAMS.

A PAPER READ BEFORE THE NEW ENGLAND WATER-WORKS ASSOCIATION, IN PROVIDENCE, R. I., JUNE 14, 1888.

By STEPHEN E. BABCOCK, Civil and Hydraulic Engineer.

THE ideal drink of water is out of "the old oaken bucket that hung in the well." Remove the old bucket with its balance beam and substitute a modern pump, the ideal drink vanishes, the water seems insipid, the charm has left the well, we wish the old bucket back, lay it all to the new-fangled notion of a pump; yet we stop there and fail to inquire the true cause. The charm lies neither in the old oaken bucket nor in the pump, but is due, pure and simple, to aeration. The bottom of the old bucket was about one inch above the chime of the staves. Every time the old bucket was sent down into the well it carried with it a quantity of air, measured by the area of bucket bottom multiplied by the depth that the bottom of bucket was inserted in the staves. The pump, owing to its mechanical construction, carried no air down into the well. Further comment seems unnecessary.

Again, on a larger scale: the mountain brook, rumbling along its rocky bottom, here a little cascade, there a pond, now coursing along a run of water-worn stones and boulders, again a waterfall, and so on for perhaps miles, yet always pure, sparkling, and palatable to the tired fisherman! This is the ideal water-supply—and why? Aeration and subsidence is the answer. What is aeration? Webster defines it, "to supply with common air."

Water is composed of oxygen and hydrogen, and is uniformly in the proportion of 100 parts of oxygen to $12\frac{1}{2}$ of hydrogen by weight. Common air is formed of oxygen and nitrogen in the proportion of 77 parts of nitrogen and 23 parts of oxygen (Silliman) by weight.

Air is a mechanical mixture. The oxygen of the air is abstracted by all substances having an affinity for it, with the same ease as if nitrogen was not present. A chemical combination of oxygen and nitrogen forms nitric acid. The proportions then are four measures of nitrogen to ten measures of oxygen, while in common air the proportions are four measures of nitrogen to one of oxygen. (Stockhardt.)

This is a striking example of how wonderfully the properties of bodies change when they chemically combine with each other. When *mechanically* mixed together the constituents of nitric acid form a life-sustaining gas, while when *chemically* combined they form one of the most corrosive fluids.

Oxygen has the greatest range of affinity of any known substance. Oxygen is absolutely necessary to all living creatures. Every combustion, however familiar to us, is a process of oxidation, in which the oxygen of the air combines with the particles of the burning material.

Oxygen, hydrogen, nitrogen, and carbon are the four elements which the Creator has established as the base upon which the whole structure of organic creation rests ; and from their combination with inorganic matter all the various forms of animals and vegetation proceed ; yet the inorganic matter bears a very small proportion to the whole. Take an oak tree. Out of every one hundred pounds only two to four pounds are inorganic, or ashes, and about the same proportion holds true of the animal kingdom. Oxygen seems to be the agent by which the changes in organic nature are brought about. There is no chemical change in organic nature without heat. Heat is the outward evidence of combustion, and as combustion is a process of oxidation, it follows that the changes of organic nature are substantially produced by oxygen as the agent. All animate nature is constantly undergoing a change. There is no standstill. All animal and vegetable living matter of to-day will, in the course of a short time, be again resolved into the four elements, together with the different inorganic matters of which they are composed. And so the ceaseless change goes on, as it has gone on for centuries. Oxygen has been the principal active agent through all this, all tending to purity again. Were there not some such simple, yet universal and powerful agent constantly at work, the

earth would have been uninhabitable centuries ago, due to the fouling of the water-supply, if from no other cause. Must it not then be true that the water purification is due primarily to oxidation ; and if we try to imitate nature closely, will not our success be measured by the nearness with which we approach with our imitations ? Is not nature's process of oxidation, by using the oxygen of the common air, the most available agent ? Common air is the most abundant form of matter in and about the earth. Does not the oxygen of the air combine with the impurities, form new chemical combinations, the force of gravity precipitate them, and are they not thus removed and the foul water made wholesome ? Is not this the true explanation of the purity and wholesomeness of the rock-bound mountain brook ?

PROPORTION OF AIR WATER WILL ABSORB.

Regnault, the French chemist, gives the proportion of oxygen which water will absorb. He says :

“ At the ordinary temperature water dissolves about 46-100 of its volume, or in other words, one litre of water dissolves 46 cubic centimetres of oxygen, or 100 cubic inches of water will dissolve 4.6 cubic inches of oxygen.”

Wanklyn, the well-known English water analyst, also gives the possible proportion of air which water will take up. He says :

“ Water is capable of absorbing, in a greater or less degree, every gas and every vapor which is placed in contact with it.

“ All water which has been kept in open vessels is necessarily charged with oxygen and nitrogen gases, inasmuch as these gases form the chief constituents of the atmosphere ; and if any sample of water be freely shaken up with large volumes of air, it will presently become charged with nitrogen and oxygen in certain well-ascertained proportions, dependent on a physical law.

“ A litre of water freely shaken up with large volumes of air at 15 deg. Cent. will absorb 17.95 cubic centimetres of air, the composition of which is : Nitrogen, 65.1 volumes ; oxygen, 34.9 volumes : 100.

“ The composition of the dissolved air is governed by the relative proportions of nitrogen and oxygen gases in the at-

mosphere, and by the coefficient of absorption of each gas at the temperature at which the absorption takes place. At 15 Cent. (according to Bunsen) the absorption coefficient of nitrogen is 0.0148, and that of oxygen, 0.0299, while the relative volumes of oxygen and nitrogen in air are : Nitrogen, 79 volumes ; oxygen, 21 volumes : 100.

“ The relative proportions of nitrogen and oxygen which water dissolves from the atmosphere at 15 deg. Cent. are therefore, according to the law, 0.0148×79 , 0.0299×21 , which gives in percentages, nitrogen, 65.1 volumes ; oxygen, 34.9 volumes ; total, 100.

“ If water be taken from rivers and springs and be bottled up without being freely exposed to the air, it will often be found to exhibit a very different ratio between the dissolved nitrogen and oxygen gases.

“ Thus in the autumn of 1859, W. A. Miller found that a litre of Thames water at Woolwich contained 63.05 C. C. of dissolved gases, the composition of these gases being : Carbonic acid, 48.3 C. C. ; nitrogen, 14.5 C. C. ; oxygen, 0.25 C. C. : 63.05—showing extraordinary diminution of oxygen.

“ Higher up the river the ratio of nitrogen to oxygen was quite different. Thus at Kingston, Miller found in a litre of Thames water 52.7 C. C. of gases, consisting of : Carbonic acid, 30.3 C. C. ; nitrogen, 15.0 C. C. ; oxygen, 7.4 C. C. : 52.7. As will be observed, the ratio of the nitrogen to the oxygen in this water is very nearly that which they require in a perfectly aerated water.

“ Undoubtedly the Thames water taken out of the river at Woolwich owes its deficiency of oxygen to the reducing action of urea and other matters poured into the river in the form of sewage.”

SUBTERRANEAN WATERS.

Again I find that in a paper read before your association at Manchester, in June, 1887, Mr. Charles Brush, C.E., of Hoboken, N. J., says :

“ It is absolutely essential to good water that there shall exist in it a certain equilibrium of animal and vegetable life, in order to produce and regulate the quantity and quality of gases essential to maintaining it in good condition. Promi-

nent among these gases is oxygen—not the oxygen of which the water is actually composed, but rather additional oxygen in solution in the water, which varies greatly under different conditions. With an excess of oxygen in solution, stagnant water is never found. Filtered waters, or what is practically the same thing, waters obtained from subterranean sources of supply, such as galleries or deep closed wells, after passing through natural filter beds, are generally bright, clear, and quite palatable. If allowed to stand any length of time, however, in an open reservoir, such water soon deteriorates.”

The philosophy of this probably is, that the absorption of oxygen from the air again causes new chemical changes to occur, the composition of the water is changed, and for the worse probably. If left a great length of time the new combination would throw down precipitates, and the water would be essentially changed in its chemical constituents.

Again Mr. Brush says :

“ The best supply is always obtained from water in motion. All waters, and especially those obtained from the surface streams, are better at some seasons of the year than at other seasons, and these seasons differ with the different sources of supply. Generally, however, the worst season with any is either in mid-winter, or in mid-summer. In the former case, when the streams are frozen over, the air is no longer in contact with the water, and consequently the water lacks life. In the heat of summer, especially after luxuriant vegetation, the oxygen in solution in the water seems to be used up to a greater or less extent, and there is an excess of vegetable life. In both cases the result is a fishy taste and smell, and algæ are likely to develop.”

The English Royal Commission on water-supply (1869) in their report say :

“ If the waters of the Thames had no impurities beyond the solid mineral contents, the question as to their wholesomeness and general suitability for the supply of the metropolis (London) would be easily disposed of.

“ But attention has been called strongly to the organic impurities contained in Thames water, which, though more indistinct in their form and less appreciable in their quantity, are said to be more deleterious in their nature and to render

the water, if not dangerous and unwholesome, at least liable to suspicion. The organic compounds dissolved in the water appear to be of very unstable constitution and to be very easily decomposed, the great agent in this decomposition being oxygen and the process being considerably hastened by the motion of the water.

“ Now as such waters contain naturally much air dissolved in them, the decomposing agent is ready at hand to exert its influence the moment the matter is received into the water, in addition to which the motion causes a further action by exposure to the atmosphere, and when (as in the Thames) the water falls frequently over weirs, passes through locks, etc., causing further agitation and aeration, the process must go on more speedily and more effectually. The effect of the action of oxygen on these organic matters, when complete, is to break them up, to destroy all their peculiar organic constitution, and to rearrange their elements into permanent inorganic forms, innocuous, and free from deleterious quality.”

PURIFICATION.

Alum is the substance now almost universally used in the patent filters of the present day, yet an examination into its chemical constituents would seem to show that its efficiency is due to the large proportion of oxygen that goes to make it up. Its chemical symbol is $\text{Al}_2\text{O}_3, 3\text{SO}_3 + \text{KO}, \text{SO}_3 + 24\text{HO}$, which being reduced to its elements indicates that 27.38 parts of the earthy metal aluminium, 64 parts of sulphur, 39.19 parts of potassium, 24 parts of hydrogen, and 320 parts of oxygen make up the whole.

Humber, in his work on water-supply, says :

“ Oxidation is another process carried on by nature for the purification of fouled water. It operates upon the class of impurities which, with one exception, are most to be feared—viz., organic matters liable to decomposition or already partially decomposed. The oxygen which is always dissolved in water exposed to the air and the free atmospheric oxygen with which the organic matter is brought into contact by the motion of the water, combine with that organic matter, thereby converting it into harmless nitrates, nitrites, and carbonic acid. The more violent the agitation and more com-

plete the aeration of the water, the more thoroughly will the organic matter be broken up and changed into these innocuous inorganic forms. The purifying agent is always at hand and in superabundance ; it is only necessary to utilize it by bringing it into contact with the substances upon which it has to act."

The concurrent testimony of all who have looked up the question of water impurities and their removal seems to be, that a violent mixing of common air with water is the most effectual and natural remedy.

At Little Falls, N. Y., where I am now engaged in constructing a water-works system, the source of supply is an exceptionally pure mountain brook of three to four millions gallons daily run. It is the finest trout brook in the whole section around Little Falls, yet as I bring the water $8\frac{3}{4}$ miles through an enclosed conduit, I concluded to try and imitate nature's process of improving it, and with what success the following description will enable you to judge :

The closed conduit terminates at a point about 2500 feet from the distribution reservoir. From here to the distribution reservoir I constructed an open, paved channel to near the distribution reservoir. The object of this open channel is to aerate the water by causing the same to pass over a series of sixteen weirs, 10 feet long, 2 feet high, distributed along the open channel at intervals of 50 and 100 feet apart, as the contour of ground admits. The paved channel begins at end of conduit, starting with a retaining wall and is 3 feet wide on the bottom, 5 feet from top of bank down to grade, 3 feet 9 inches of which is excavation in natural soil. The excavation is utilized to form tow path and berme banks, 6 feet wide, on each side of open channel throughout the whole length of the same, preventing any surface drainage from entering the canal. The open channel is carried 390 feet to a ravine or depression in surface of the ground ; here a retaining wall is built up to top banks and 2 feet above the natural surface of the ground ; the water is then carried in a pipe 160 feet, through under the surface of the ravine. At the outlet another retaining wall is built up to top bank and 2 feet above the natural ground. Open channel starts again and is carried along for 580 feet to another ravine 100 feet long, where the water is again carried

under through pipes and protected by vertical walls at each end, and with weirs or dams placed 50 and 100 feet apart, of the same size and dimensions as first stated. The water is again carried 700 feet in open channel to a point near the line of by-wash canal, which carries the water of the several streams formerly running through the reservoir past, without entering the reservoir enclosure. From this point the water is conveyed in an iron pipe, 970 feet, to and through the bed of the distribution reservoir to a point out in the centre of the same, distant about 430 feet from the gate-house and 100 feet from the sides of reservoir ; here the pipe is turned up vertically and held in place by a rectangular mound of masonry, which is carried up 2 feet above water surface of the reservoir. The water is allowed to fall over the sides of a square coping on top of mound, giving a final oxidation to the water as it mingles with the waters of the reservoir.

The total oxidation of the water after it has been confined in $8\frac{3}{4}$ miles of conduit is represented by the aeration over sixteen weirs or dams, 10 feet wide 2 feet high, a total length of open channel 1600 feet, with a final overfall in the centre of the reservoir, removing all possibility of fouling the water by surface wash on edge of reservoir. Again, by passing the water through pipes under the two ravines, all the surface water and drainage from the end of conduit to the diverting, or by-wash canal, is carried on the surface of the ground through these ravines, and cannot contaminate the water in open canal.

Near the point where the iron pipe from last section of aerating canal passes under the diverting or by-wash canal, I placed a branch with a pipe leading into by-wash canal, locating valves on two ends of the branch. The aerating canal forms also a series of subsiding ponds or reservoirs, and to provide for a ready means of cleaning them, I placed the above-mentioned branch controlled with its valves. Whenever the canal ponds become filled with precipitated matters, the line leading to the distribution reservoir may be closed, the one leading to the by-wash canal opened ; this allows all the water to waste into the by-wash canal. To clean the ponds and canal, it is only necessary to stir up the deposits with brooms or other suitable tools, and the water carries

them along down and out through the by-wash canal to waste, until such time as the canal has been cleaned and water runs clear, when by changing the valves the pure water may again be sent into the reservoir. The water is kept in a constant state of agitation with the air, from the time it strikes the first dam to the end of the aerating canal. This I claim to be a fairly close imitation of nature's own way of rendering water pure and wholesome as well as pleasant and palatable.

Yet there is one item in water purification also to be looked into, the exception referred to by Humber. That it is a disputed point as yet as to how far aeration goes in removing the living germs, seems to be the fact. Humber says :

“ The class of impurities of which exception was made as being that most to be feared, is unfortunately the class upon which the action of simple oxygen is of the most doubtful efficiency. The microscopic organisms known as germs would seem to defy the action of oxygen by that very element of vitality which renders them so persistently dangerous. While, however, the opinions of scientific men on this point are still so conflicting, it would be unwise here to do more than recommend the strictest caution.”

I determined to obviate this possible danger by adding a *coke filter* in the inlet chamber of the distribution reservoir. The particular description of inlet chamber and filter is as follows :

The inlet chamber is of rubble masonry divided into three compartments. The first compartment nearest the water is arranged with two sets of screens running from top to bottom of house ; three inlet tubes are placed on the inner side of this chamber, governed by regulating valves ; these inlet tubes are placed at different elevations below the surface. Water may be drawn from either one as may be required. The water then passes into the middle chamber which is a coke-filter bed. The coke extends down from the top to a rack placed 5 feet above the bottom of the chamber. From this chamber the water is drawn into the third chamber by another inlet tube placed 2 feet above bottom and below the coke. From the third chamber two pipes lead the water down to the distribution system. A 12-inch mud pipe is also pro-

vided, laid through from the front chamber to the outer line of the embankment.

Provision is made to clean the filter from time to time as may be required without interfering with the supply to the distribution, as follows: A short 12-inch inlet cleaning tube is led from near the bottom of the outer chamber to a point directly under the centre of base of the coke. A 12-inch waste pipe connecting by branch with the mud pipe is let in from top of coke in middle chamber down to mud pipe in third chamber. Two additional supply pipes are carried through from chamber No. 1 to chamber No. 3, to use to supply the distribution while the coke is being cleaned.

When the filter is to be cleaned the regular filter inlet tube is closed up. The additional supply pipe leading past filter is opened, supplying the distribution independently of filter bed. The short 12-inch inlet cleaning tube is opened; the water then passes up through the coke, reversing the line of flow, thus freeing the coke from all the deposits, and the foul water is passed off through the 12-inch waste pipe that leads from the top of the coke down to the mud pipe and thence out to the ground at the foot of slope of bank. The coke may thus be cleaned as often as it is found necessary. I adopted coke as a filter material from its very favorable action on the microscopic living germs.

Mr. Percy Frankland, the well-known English analyst, has made some very exhaustive experiments, to determine the relative values of coke, animal charcoal, and other substances. (Proceedings of Institute of Civil Engineers, England, 1886.) He says:

“Until the method of water examination by gelatine culture was devised, there were no available means by which the relative efficiency for the removal of micro-organisms of different filtering material could be estimated on a quantitative basis. The author has submitted to examination, as regards their efficiency in this respect, a number of filtering materials, employing in all cases equal thicknesses of the various substances, which were also prepared in the same state of division. The results obtained in these experiments were:

“Ferruginous green sand. Initial efficiency, organisms per cubic centimetre, before filtering, 80; after, none. Reduc-

tion per cent, 100. After thirteen days, before filtering, 8000 ; after, 1000. Reduction per cent, 88. After one month's action, before filtering, 1280 ; after, 780. Reduction per cent, 39.

“ Animal charcoal. Initial efficiency, organisms too numerous to count before filtering ; after, none. Reduction, 100 per cent. After thirteen days' action, before filtering, 2800 ; after, none. Reduction per cent, 100. After one month's action, organisms before filtering, 1280 ; after, 7000. Reduction, none ; but an increase of 447 per cent.

“ Coke. Initial efficiency, organisms per cubic centimetre before filtering, 3000 ; after, none. Reduction per cent, 100. After five weeks' action, before filtering, 6000 ; after, 90. Reduction per cent, 98½.

“ The author has made further experiments on the efficiency of coke as a filtering material. In these experiments the filters employed were of similar construction, but an aqueous extract of garden soil was employed instead of urine water. Two similar filters (a) and (b) were submitted to examination under conditions as similar as possible.

“ Unfiltered water, 26,000 organisms per cubic centimetre :

Filter (a).....none.

Filter (b).....none.

Reduction in both, 100 per cent.

After three weeks' action, twenty-first day :

Unfiltered water2230 organisms.

Filter (a)..... 339 “

Filter (b)..... 219 “

Reduction (a), 85 per cent ; (b), 90 per cent.”

Mr. Frankland's experiments show that with the coke filter properly attended to, it may be relied upon to do the work expected.

I am satisfied that this system of water purification by aeration, using water-ways or canals and a series of low dams, may be adapted to both gravity and pumping systems, and forms a permanent, cheap, and reliable method of improving the quality of potable water, and when once constructed it runs itself.

FILTERS—I.

THE prime object of a filter is to take out from water or other liquid some substances which are mechanically entangled with it, and the presence of which is undesirable.

There are many kinds upon the market and in use by households, chemists, and industrial works. Some of these are mere strainers, separating coarse impurities which are not in any way "dissolved" (as the term goes) in the water or other liquid; although just where the line between solution and mechanical mixture should be drawn is a vexed problem.

Among the materials employed for filtering there may be mentioned hay, shavings, sponge, cloth, coke, gravel, sand, coarse broken charcoal, fine charcoal, natural porous stone, artificial stone, and porcelain. Each of these has its advantages for some special conditions and purposes, and each again has some disadvantages which makes it undesirable under certain circumstances.

Broadly considered, filters may be divided into (1) those which act solely by mechanical separation—that is, simply as strainers, and (2) those which in addition effect a chemical change in the liquid passed through them. Most of the substances employed act mechanically only.

Making another classification, we find filtering materials divided into (1) those in which the pores are natural and fixed and (2) those in which there are, strictly speaking, no filtering pores other than the interstices among the solid particles of filtering material.

Considered in the light of mechanical or chemical action, none of the materials mentioned, except charcoal, acts otherwise than by straining; charcoal having a special action, due to its power of oxidizing substances which pass through it. In this connection attention may be called to the fact that charcoal is not, as is generally or popularly considered, an antiseptic. On the contrary, so far from preventing decomposition, it actually promotes it. A piece of meat packed in charcoal will be actually corroded away; and charcoal dress-

ings of sores and wounds are known to eat into the flesh. Still, while causing oxidation rather than preventing it, the fact that charcoal may prevent all offensive smell, even while causing decomposition, makes it the best "all-around" material for filters of which I know.

As regards their mechanical structure, filtering materials may be divided into those having fixed pores which exist within the body of the blocks or masses of the material and those which have particles practically non-porous and in which the interstices are among the particles.

Of the first class, we may consider coke, charcoal, artificial and natural stone, sponge, and porcelain; and of the second, cloth, hay, shavings, gravel, and sand.

From the nature of things, it follows that these two classes of materials have a different class of filtering action; that the results of their work will be widely different. In the first case, we should expect to find most of the matter which was removed deposited in the cells or pores. In the second, it will be upon the outer walls of the solid particles. In the first case, they are held with a tenacious grip, the strength of which is in direct ratio to the value of that material for that kind of filtering. On the other hand, where the material is merely deposited upon the outer walls of the solid particles, while there is, of course, a certain amount of adhesion between the deposited and those solid particles, it is very rarely that agitation and washing will not dislodge them. In the first case, fire is about the only means of purifying the filtering material; in the second, it is not necessary, and the substance can be cleansed and used again one or many more times. There are some of these porous substances (as, for instance, charcoal, and, perhaps, coke) which, being combustible, cannot be cleansed by fire; others, as porcelain, may be thus purified over and over again.

From this it might be very sensibly argued that any filter which is claimed to be perfectly reversible—that is, which it is claimed can be cleansed by simply turning it upside down and running the water through it the other way from its first direction, is on the face of it an imperfect filter—is simply the coarsest kind of a strainer, which merely prevents impurities from going through it. There is no funnel-shaped pore

of which I have any knowledge which is single-acting, so as to prevent solid particles from going through it in one direction, and which will clog up when the water flows in one direction and will not when it flows in the opposite way.

Where comparatively small particles of coke are used, in the same way as gravel and sand are, to entangle solid particles among them, and these particles get fouled by the external coating, cleansing may be accomplished by any means which combines agitation of the particles and a strong current of water; the result in this case being to wash off and carry away most if not all of the external foul coating, without adding to it, because the filter when in this agitated condition is no longer a filter, its straining interstices being opened out. Such filters are practically renewable. Those in which the position of the particles cannot be rearranged are not so.

Cloth filters, whether the liquid passes through a number of layers, from one side of the fabric to the other, or whether they are composed of a number of thicknesses through which the liquid exudes in the plane of the separate cloths (the latter being by far the better) are also practically renewable by washing, as they may be dismounted and each cloth washed separately; but no amount of reversal of current will cleanse them. It is impossible that a filtering material shall at the word of command cease to filter just because its proprietor wills that it shall let go of fouling particles instead of holding on to them.

There are some substances which act very well for a certain class of solid impurities, and which are not worth cleansing; among these may be mentioned hay, shavings, and the like, and which are so cheap that they should be thrown away as soon as they show signs of being foul.

There are filtering materials which of themselves do not act with very great thoroughness in taking out certain kinds of foreign substances, but which may be made much more efficient by first changing the nature of the material to be taken out. For instance, with albuminoid ammonia, which is one of the most dangerous contaminations of water for domestic purposes, the ordinary coke filter is of very little use; but if before the albuminous material enter the filtering chamber it have mixed with it a small proportion of ordinary alum, the

effect will be to so coagulate the albuminous matter as to render it very readily separable by the coke and other substances. The difference is most marked. If the proportions of alum and albuminoid material are just right, there is absolutely no alum passed through with the purified liquid. If, however, there be not enough alum, some albuminoid material will pass through. On the other hand, if there be too much alum, its excess will be found in the liquid which has passed through. I need hardly state that either of these two latter conditions is undesirable. Yet while either of them is likely to occur, either of them, also, can in great measure be prevented by an approximate analysis of the water before it enters the filter. In many places there are certain times of day or certain days of the week, as well as certain seasons, when the proportion of albuminoid material reaches a maximum; and this may be prepared for; and the minimum in the same manner.

Porcelain filters upon the Pasteur principle, in which fine tubes of bisque receive the fluid upon the outside and pass it out from within, act by straining out the foreign matters, which are left upon the outside of the tube, whence they may be removed by brushing and washing. It is claimed that the pores in this material are so fine that they remove all mechanically suspended matters and leave the water which has been forced through the walls of the tubes absolutely free not only from such suspended matter, but also from germs of bacteria or other such organisms. The cleansing of these tubes may be aided by putting them in a bright fire after they have been washed; this action taking out any combustible material which may have been forced into the pores of the tubes.

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"ENGLISH AS SHE IS WROTE."

By GEORGE H. WESTLEY.

QUITE recently I came across, for the first time, Mark Twain's amusing collection of examples of "English as She is Spoke," by the American schoolboy. On showing it to a

young Englishman of my acquaintance, who had recently come over to this country, he entertained me with a number of queer definitions and translations which, he assured me, had come under his personal notice during his experience as master in an English school, and some of which, I think, are really worth transcribing.

There is an impression that a teacher's life during school hours is one of unmitigated boredom ; a "grind," pure, simple, and dismal ; but this is not likely to be the case, unless he is wholly deficient in the power to appreciate the unconscious humor that is perpetually dropping from the tongues and pens of the pupils.

The true pedagogue, says my English friend, regards himself as a student with those whom he teaches. With him there is no such term as a "finished education." He is ever marking the development of his scholars, and often, in examining the modes of reasoning by which they arrive at their most astoundingly foolish conclusions, he finds that their methods are not altogether stupid, and that in what appear to be wonderful displays of ignorance and the darkest depths of denseness may be discerned rays of light and sense. And so he finds his form capable of being not only interesting, but instructive also.

This gentleman had classified the *outré* boys in his class, or "form," as he called it, in the following manner : First, there were the "stupid-good" boys, by which he meant those of a literal and utterly unimaginative turn of mind ; those who do their work honestly, but trust solely to their dictionaries and lexicons to bring them through their difficulty. Such a boy was it by whom "naval force" was neatly rendered into *umbilica vis*, and the *Si torrere jecur quaeris idoneum* of Horace into "If you wish to warm your useful liver."

Next came the "muddled"—boys not without sense and knowledge, but who came to grief for want of power of arrangement and discrimination. The following is meant for a short account of the siege of Samaria, by one who came under this head : "In the siege of Samaria there was a great famine, and as the king was walking along the wall, a woman cried unto him and said that if she would boil her child they would eat it that day and that she would boil hers and eat it the next,

but she said that she boiled hers and they ate it but the other woman hid hers and would not boil it.”

Then there are the “simple”—those who apply the most homely expressions to the grandest subjects, and in their simplicity make such childish mistakes as do honor to their hearts, if not to their heads. In this class, I fancy, might be found many of those chubby, round-faced youngsters of Du Maurier, who so often amuse us with their innocent and smile-compelling remarks. The simple come to much grief in writing from dictation. Here are a few characteristic specimens: “If ever two great men might seem during their whole lives to have moved in direct opposition, Milton and Jerry my tailor were they.” Another had this variation on Scott:

“The way was long, the wind was cold,
The minstrel was infernal old.”

Perhaps I should say here that the teacher to whom I refer, and by whom those sentences were read aloud to his class, has a strong voice and a very distinct enunciation, so that the errors made are attributable to some such quality as he has ascribed in the boys themselves.

In writing out “Lord Ullin’s Daughter,” from dictation, one of the simple had this:

“‘Come back, come back!’ he cried in Greek,
Across the stormy water.”

Macaulay’s lines were made to read:

“Hard by, a fleshier on a block had laid his vittles down,
Virginius caught the vittles up, and hid them in his gown.”

And another line by the same author:

“And the red glare on Skiddaw roused the burglars of Carlisle.”

Now for a few examples of their translations:

Vere fruor semper—“Truly I always feed.” When the heart-broken Dido sees the ships of Æneas getting under sail, she cried, “*Pro Jupiter ibit!*” which one pupil rendered into, “By Jove, he is going!”

Rapientibus esseda mannis—“The chariot with the captivated cobs.”

According to one of this class, Metellus was called Calvus because “he was such a calf,” and a comedy by Shakespeare is “The Taming of the Mole.”

During a Euclid lesson the master asked for a definition of a circle, and was answered by a pupil who described a ring in the air with his forefinger, ejaculating, "A dodge like." Think how ludicrous this explanation must have been, accompanied as it was by an eager, innocent expression on the face of the lad as he uttered it.

Next in the list came the "careless." This is a very large body, being composed of boys who let their young intellects run riot. They do not shrink from wild statements and violent imaginings, and may be seen at their best, or rather worst, when questions are being passed rapidly round the class. For instance, when the question was asked, "What is meant by milch kine?" one of the careless promptly answered, "male cows."

Question. Derive an English word from *Necto*, I bind?

Answer. Neck-tie.

Q. We do not speak of Enoch's ascension, but of his—?

A. Transportation.

Q. What was the comparative duration of the kingdoms of Judah and Israel?

A. Their comparative duration was long.

Q. For what god was St. Paul taken at Lystra?

A. Venus.

Q. What fruit did Aaron's rod bear?

A. A kind of plum.

Q. What Italian poet did Surrey imitate?

A. "Plutarch," leading to another answer, "Pluto."

From the history papers of the next class—the conceited ignorant—a class productive of rich fruit in the way of scholastic wit, the following are taken:

Q. State what you know about Mithridates?

A. Mithridates was clever, and used to write poems, some of which are very beautiful.

Q. Give an account of Cromwell's continental policy?

A. Cromwell was a kind father and husband, and had nine children.

Q. Explain "all to brake his scull?"

A. This, perhaps, is a little confusing to uneducated minds now, but was a common phrase in the time when the Bible was translated. Jael drove the tent-peg into Sisera's head, in order that she might break his scull.

Q. What was the end of Pausanias?

A. Pausanias was killed by a young man, who was chaste and ran away.

Last on the list are the "eccentric," the boys who suffer from obliquity of mental vision. These are the embryo punsters, who will, doubtless, some day contribute to the columns of *Punch* and other papers of that kind. They have a strange faculty for catching the similarity of sound or form in words. One expression reminds them of another, for which it is at once mistaken. *Dido vento reditura secundo*, one translates into "Dido soon to return with her second wind." *Nulla mora est*—"No woman is a character." Perhaps the boy who translated the latter had seen Pope's malicious line :

"Most women have no character at all."

Sedesque discretas piorum—"Reserved seats for the pious."

It strikes me there are few things in Mark Twain's collection superior to this :

Q. What is a dependent sentence?

A. One that hangs on by its clause.

Or this absurd, though at the same time curiously ingenious "character of Gideon :

"Gideon was a true, unbelieving Jew,

Still he was a good man, though rather idolatrous."

Think, said my friend, think how refreshing it must be to the weary examiner, sitting up half the night to look over papers, to come now and then across an oasis of this kind in the desert of stupidly correct or stupidly incorrect performances. Think, too, how much the humor of the oral answers must have been enhanced by the innocent, or puzzled, or sheepish, or conceited, or desperate look of the youngster as he uttered them. Verily, the schoolmaster must have a very uncongenial occupation indeed who, with such pupils, has a tiresome time of it.—*Boston Transcript*.

THE RELIGIOUS PRESS AND QUACK MEDICINES —SUBSTITUTES FOR WHISKEY.

RESOLUTIONS adopted at the Thirteenth Annual Session of the State Medical Society of Arkansas, held at Fort Smith, April 25th, 26th, and 27th, 1888, endorsed by the American

Medical Association and by reputable physicians everywhere :

“ *Resolved*, That the members of the State Medical Society of Arkansas have for years observed with pain and mortification the patronage given to charlatanism in all its multifarious aspects by the religious press of our country.

“ *Resolved, further and most specifically*, That the appearance in religious papers, ostensibly published for the inculcation of truth and morality, of serious homilies on prayer and praise side by side with cures for consumption, cancer, Bright’s disease, and other incurable ailments, to which an editorial endorsement is often given, as well as secret preparations under the cloak of remedies for disease, but really intended for purposes of foeticide and other immoral uses, largely tends to shake the confidence of the profession of medicine in the integrity and purpose of the managers and editors of such journals.

“ *Resolved, further*, That it has been the well-known custom of the profession to render services gratuitously to clergymen, which we do not regret, nor do we propose to recall, yet we must assert that the frequent occurrence of endorsements and recommendations of the clergy of peripatetic doctors and advertising charlatans has in many instances been the only reward of our gratuitous services.

“ *Resolved, further*, That we are aware that the editors of religious newspapers admit the painful situation in which these advertisements place them, and attempt to excuse themselves by saying that it is necessary to take these advertisements in order to obtain means to conduct their papers ; but, in the language of orthodox theology, we would say : ‘ Put behind you that damnable doctrine that we must do evil that good may come.’

“ *Resolved, further*, That, as a society, we declare that the continued perpetration of the above offences by some of the clergy and religious press brings harm to the bodies of their constituency and damages materially their influence upon the thinking class of the medical profession.”

Apropos to the foregoing, we extract from the report of the Analyst of Drugs, Dr. BENNETT F. DAVENPORT, to the State Board of Health Report of Massachusetts for 1887, who says :

"I have examined the following list of samples of proprietary preparations, tonics, and bitters with special reference to the relation which the percentage of alcohol which they were found upon assay to contain might bear to the admission of the presence of any or claims for the absence of alcohol, as given upon their labels and wrappers. I have also noted the doses and frequency with which they were recommended to be used, as well as the place of their origin. The alcohol found upon assay is given in per cent by volume. How far the claim of some of them for special usefulness in the reformation of intemperate habits is justified is self-evident."

TONICS.

Dr. Buckland's Scotch Oats Essence, New York City. "Enough alcohol is added to dissolve resins, and prevent fermentation." "Not a temporary and fleeting stimulant, but a permanent tonic. Its use must be regular and continued over a considerable period. An extract of double and triple strength also made. Dose, 10 to 15 drops, to a teaspoonful three or four times daily, increased as needed." In the simple essence 35 per cent of alcohol was found on assay. Further examination of this article reveals a still more dangerous ingredient in its composition. The sample analyzed was found to contain one fourth grain of morphia to the ounce of the so-called "Essence of Oats." A more insidious and dangerous fraud can scarcely be imagined, especially when administered, as this is recommended, for the cure of inebriety or the opium habit.

Carter's Physical Extract, Georgetown, Mass. Dose, 1 tablespoonful three times daily. 22 per cent of alcohol found on assay.

Hooker's Wigwam Tonic, Haverhill, Mass. One tablespoonful three times daily. 20.7 per cent of alcohol found on assay.

Hoofland's German Tonic, Philadelphia. Admits Santa Cruz rum. Wineglass, four times daily. 29.3 per cent.

Hop Tonic, Grand Rapids, Mich. One tablespoonful to wineglass three times a day. 7 per cent.

Howe's Arabian Tonic, New York. "Not a rum drink." Tablespoonful to wineglass, four times daily. 13.2 per cent.

Jackson's Golden Seal Tonic, Boston. Admits Marsala wine. Half wineglass three times daily. 19.6 per cent.

Liebig Co.'s Cocoa Beef Tonic, New York. "With sherry." Two to four teaspoonfuls three times daily. 23.2 per cent.

Mensman's Peptonized Beef Tonic, New York. "Contains spirit." One tablespoonful to three, three times daily. 16.5 per cent.

Parker's Tonic, New York. "A purely vegetable extract." "Stimulus to the body without intoxicating." "Inebriates struggling to reform will find its tonic and sustaining influence on the nervous system a great help to their efforts." Dose as tonic, one to two teaspoonfuls, one to three times daily. 41.6 per cent.

Schenck's Sea-Weed Tonic, Philadelphia. "Distilled from sea-weed after the same manner as Jamaica spirits is from sugar-cane. It is therefore entirely harmless and free from the injurious properties of corn and rye whiskey." Dose, half wineglass three times daily. 19.5 per cent.

BITTERS.

Atwood's Quinine Tonic Bitters, Boston. Dose, half tablespoonful to half wineglass, mixed with water, wine, or spirit, three times daily. 29.2 per cent.

L. F. Atwood's Jaundice Bitters, Portland, Me. Half tablespoon to half wineglass one to six times daily. 22.3 per cent.

Moses Atwood's Jaundice Bitters, New York. Half tablespoon to wineglass one to six times daily. 17.1 per cent.

H. Baxter's Mandrake Bitters, Burlington, Vt. One to two tablespoonfuls. 16.5 per cent.

Boker's Stomach Bitters, New York. Dose not given. 42.6 per cent.

Brown's Iron Bitters, Baltimore, Md. "Perfectly harmless." "Not a substitute for whiskey." Tablespoonful. 19.7 per cent.

Burdock Blood Bitters, Buffalo, N. Y. Teaspoonful to tablespoonful three times daily. 25.2 per cent.

Carter's Scotch Bitters, Georgetown, Mass. Tablespoon to wineglassful, as occasion requires. 17.6 per cent.

Colton's Bitters, Westfield, Mass. Teaspoon to two tablespoonfuls three times daily. 27.1 per cent.

Copp's White Mountain Bitters, Manchester, N. H. "Not an alcoholic beverage." Wineglassful. 6 per cent.

Drake's Plantation Bitters, New York. "Contains St. Croix rum." Wineglassful three times daily. 33.2 per cent.

Flint's Quaker's Bitters, Boston. Teaspoonful six times daily. 21.4 per cent.

Goodhue's Bitters, Salem, Mass. Half wineglassful. 16.1 per cent.

Hartshorn's Bitters, Boston. Tablespoon to half wineglassful. 22.2 per cent.

Hoofland's German Bitters, Philadelphia. "Entirely vegetable and free from alcoholic stimulant." Tablespoonful four times daily. 25.6 per cent.

Hop Bitters, Rochester, N. Y. One to three tablespoonfuls three times daily. 12 per cent.

Hostetter's Stomach Bitters, Pittsburg, Pa. Wineglassful three times daily. 44.3 per cent.

Kaufmann's Sulphur Bitters, Boston. "Contains no alcohol." Tea to tablespoonful. It contains no sulphur, but has 20.5 per cent of alcohol.

Kingsley's Iron Tonic, Northampton, Mass. One to two teaspoonfuls three times daily. 14.9 per cent.

Langley's Bitters, Boston. Half wineglass or more three times daily. 18.1 per cent.

Liverpool's Mexican Tonic Bitters, Boston. Half to full wineglassful three times daily. 22.4 per cent.

Oxygenated Bitters, New York. Tea to tablespoonful. Acid, but no alcohol.

Pierce's Indian Restoration Bitters, Boston. Up to wineglassful and to six times daily. 6.1 per cent.

Z. Porter's Stomach Bitters, New York. Tablespoonful or more several times daily. 27.9 per cent.

Rush's Bitters, New York. Wineglassful four times daily. 35 per cent.

Dr. Richardson's Concentrated Sherry Wine Bitters, Wakefield, Mass. Tablespoonful to half wineglass or more three times daily, "or when there is a sensation of weakness or uneasiness at the stomach." 47.5 per cent.

Secor's Cinchona Bitters, Providence, R. I. Half wineglassful three times daily. 13.1 per cent.

Shonyo's German Bitters, Concord, N. H. Table to wineglassful. 21.5 per cent.

Job Sweet's Strengthening Bitters, New Bedford. Tablespoonful to wineglass three times daily. 29 per cent.

Thurston's Old Continental Bitters, Lynn, Mass. Tea to two tablespoonfuls. 11.4 per cent.

Walker's Vinegar Bitters, New York. "Free from all alcoholic stimulants. Contains no spirit." Half to full wineglass. 6.1 per cent.

Warner's Safe Tonic Bitters, Rochester, N. Y. Table to wineglassful. 35.7 per cent.

Warren's Bilious Bitters, Boston. Teaspoon to two tablespoonfuls one to three times daily. 21.5 per cent.

Wheeler's Tonic Sherry Wine Bitters, Boston. Two thirds wineglass two times daily. 18.8 per cent.


Wheat Bitters, New York. Dessert to wineglass three times daily. 13.6 per cent.

Faith Whitcomb's Nerve Bitters, Boston. Tablespoonful three times daily. 20.3 per cent.

Dr. William's Vegetable Jaundice Bitters, Lowell, Mass. Half to full wineglass one time daily. 18.5 per cent.

ADULTERATION AS DEFINED IN LAW.—According to the Massachusetts Adulteration Act, an article of food is deemed to be "adulterated" within the meaning of the act: "(1) If any substance or substances have been mixed with it so as to reduce or lower or injuriously affect its quality or strength. (2) If any inferior or cheaper substance or substances have been substituted wholly or in part for it. (3) If any valuable constituent has been wholly or in part abstracted from it. (4) If it is an imitation of, or is sold under the name of, another article. (5) If it consists wholly or in part of a diseased, decomposed, putrid, or rotten animal or vegetable substance, whether manufactured or not, or, in the case of milk, if it is the product of a diseased animal. (6) If it is colored, coated, polished, or powdered, whereby damage is concealed, or if it is made to appear better or of greater value than it really is. (7) If it contains any added poisonous ingredient, or any ingredient which may render it injurious to the health of a person consuming it."

EDITOR'S TABLE.

 ALL correspondence and exchanges with THE SANITARIAN and all publications for review should be addressed to the editor, Dr. A. N. BELL, 113A Second Place, Brooklyn, N.Y.

PUBLIC EDUCATION IN BROOKLYN.

The state of public education in Brooklyn, as exhibited by the Annual Report of the Superintendent of Public Instruction for the year 1887, is as follows : Number of pupils on register at the close of the year, 75,290 ; increase for the year, 3311 ; increase in the capacity of the schools for the same period, 4938 seats. This apparent discrepancy or excess of accommodation is explained by comparing the registration in December, when it is always smaller, with what it is in spring and fall, and when a considerable portion of the new accommodations was used to relieve classes that had been overcrowded. What the capacity of the sitting is—the cubic feet of air and floor space per pupil—the report does not inform us. A few years ago, in some of the primary departments, particularly, it was estimated by the “breadth of beam” of the children, but from our knowledge of the moving spirits of the Board of Education, as at present constituted, and what has been accomplished in recent years in increasing the capacity of the schools, there has evidently been creditable progress made in this regard, though not yet to the required extent ; for, as clearly intimated by the superintendent, there is still considerable overcrowding in the primary departments, which leads him to say : “ I am of the opinion that it would be judicious on the part of the Board of Education to pass a resolution to the effect that after a given date, say January 1st, 1889, not more than sixty pupils should be placed on register in any class in the public schools. . . . Whether, therefore, this question be viewed from the standpoint of school economy or from the child's welfare, all considerations demand that the

registers of the lower primary grades should be reduced to reasonable proportions. I have mentioned sixty as the maximum number for a class, but even this is much too large." The new buildings are said to be "commodious, well-ventilated, heated, and lighted, and are in every respect models of school architecture." Nothing is said of the sanitary condition of the premises, however, hence we are left to infer it is satisfactory to the superintendent, or that the preserves of the Committee on Health are too sacred for comment.

The number of teachers of all grades employed at the close of 1887 was 1664—100 more than at the close of 1886; the increase being in the grammar and primary grades respectively, 24 and 79, while of principals there are three less.

The number of different pupils instructed during the year was 102,249; the average daily attendance, 67,711—2942 more than in 1886. The average number of days which the whole number of different pupils attended school was 133.7—there being 202 days in the school year.

Sixteen pages are devoted to a description of the course of study adopted in June, 1887, which bears evidence of some progress, or at the least, that a beginning has been made in the study of hygiene. In the schedule of subjects of examination under the head of Teachers' Certificates in grade B, physiology and hygiene have been substituted for astronomy; and in the catalogue of "Examination Questions for Graduation from the Grammar Schools and for Admission to the Central (High) School" are the following, which compare favorably with other subjects:

"1. Define physiology, hygiene. Explain the term function as used in physiology.

"2. Name all the fluids (secretions) with which food is mixed during mastication and digestion, and indicate the part of the alimentary canal in which each is secreted.

"3. What is a stimulant? A narcotic?

"4. Describe the effect of alcohol on the brain.

"5. Describe the effect of alcohol on digestion.

"6. What is meant by the oxygenation of the blood? How and where is the process carried on?

"7. What is the scientific fact upon which all rules of ventilation are based? Why are two openings in a room always

necessary to produce a thorough change of air? How should such openings be located?

“8. What is meant by near-sightedness? Mention four causes which, if present, tend to produce near-sightedness in school children.”

“The Central School now provides a three years' language course, a two years' English course, and a two years' commercial course, following the work of the grammar schools.” The course of study is the same for both sexes. The superintendent recommends “for the girls' school that the curriculum be extended so as to include a four years' course and a three years' course; and for the boys' school that there should be, in addition to the commercial course, which is specially designed to fit boys for business, a scientific mechanical course for those who wish to devote themselves to mechanical pursuits, and a literary scientific course, which should cover all the work necessary to obtain the academic certificate of the regents of the university.

The Central School building is believed to be a model of its kind. It is now in process of being thoroughly equipped with all the appliances needful to the attainment of its high aims, and which, under the supervision of the at present accomplished principal, Calvin Patterson, promises ere long to be among the foremost of educational institutions under a public school system—an honor to the city and the State.

SCHOOL HYGIENE IN PARIS.—M. Jablonski, of Poitiers, has brought the subject of school hygiene before the Academy of Sciences.

Many children affected with contagious diseases are permitted to return to school too soon, and the disease is thus spread among those who are susceptible. Young people are often kept in schools, in boarding-houses, and in barracks who ought to be isolated. Many young men in the early stages of tuberculosis are retained as recruits, and thus become the means of spreading the disease among their associates. Those affected with tuberculosis should be isolated in lyceums and boarding-schools. This, it is understood, is a very delicate question for the medical inspector, and requires a great deal of tact on his part; but he thinks it is time the subject was treated more seriously than has been done heretofore.

At the meeting of the Board of Health of the Seine, on June 22d last, after having listened to the report of Dr. Olivier, the attention of the medical inspectors was directed to the possibility of impetigo and ecthyma in children attending the public schools being contagious, and also to the propriety of excluding them from public institutions.—*Gazette Hebd. des Sciences Méd.*

THE AMERICAN MEDICAL EDITORS' ASSOCIATION.

Our representative being unavoidably prevented from attending the latest meeting of this association, in Cincinnati, June 4th, we conceived the pleasurable intention of giving a prompt and full notice of the proceedings. Unfortunately, however, these were of a character—except the address of the president, Dr. William T. Porter, of St. Louis, and the officers-elect for the ensuing year—to forfeit this good intention, and we reluctantly notice them now only lest our silence might be construed into approval.

The leading thought of Dr. Porter's address was plans for cementing and strengthening the association, by the maintenance of independent self-respect, the avoidance of all sectional jealousies, frowning upon all elements of discord, harmony of thought and unity of purpose in upholding the dignity of the editorial calling, and strict loyalty to the medical profession. Notwithstanding, the discussion which followed was wholly foreign to these wholesome suggestions. Trade journalism—by *other people*—was the chosen subject of discussion, in the face of the fact that many medical journals, so called, are characteristically so to a degree surpassing any that are issued by drug houses and manufacturers. Many there are, published at give-away prices, with claims of enormous circulation to the trade, ostensibly devoted to medical progress, but whose motive from beginning to end is trade in advertising, edited for and published by advertising agents for the exchanges and books they can be made to bring to the editors in remuneration for the dexterous use of scissors and garblings.

"Candidly," as well observed by the *Memphis Medical Monthly*, "the meeting was one long to be remembered, not on account of its brilliancy and profitableness, but because of a lack of the majority of those characteristics that should single

out 'men who wield the destinies of the American medical press.' "

The officers elected for the ensuing year are all men of ability and acceptability, but another such meeting as that at Cincinnati should close with funeral ceremonies.

President—William C. Wile, editor of the *New England Medical Monthly*, Danbury, Conn.

Secretary and Treasurer—Dr. J. C. Culbertson, editor of the Cincinnati *Lancet and Clinic*.

Censors—Dr. R. J. Dunglison, editor of the *College and Clinical Record*, Philadelphia, and Dr. N. S. Davis, editor of the *Journal of the American Medical Association*, Chicago.

PRIZE STUDIES OF TORNADOES.—*The American Meteorological Journal*, appreciating the importance of a large increase in our knowledge of tornadoes, and believing it can be obtained by directing the public more strongly to their study, offers prizes for the best discussion of them. The sum of \$200 will be given for the best essay and \$50 for the second best, while an additional \$50 will be divided among those of special merit. A thorough comprehension of the causes of a tornado involves a large fund of information concerning the causes of almost all other meteorological phenomena, and this eminently praiseworthy effort of our esteemed contemporary is well calculated to stimulate the cultivation of a field of science full of promise to the student who will diligently cultivate it.

Climate, we have had occasion to say elsewhere, "is the sum of the influences exerted by temperature, humidity, pressure, soil, proximity to the sea, lakes, rivers, plains, forests, mountains, light, ozone, electrical conditions, and, doubtless, by some other conditions of which we have no knowledge" ("Climatology and Mineral Waters of the United States"), and he who has the most knowledge of these will be best able to deduce practical conclusions of universal application.

The essays must be sent to either of the editors, Professor Harrington, Astronomical Observatory, Ann Arbor, Mich., or A. Lawrence Rotch, Blue Hill Meteorological Observatory, Readville, Mass., U. S. A., before the first day of July, 1889. They must be signed by a *nom de plume*, and be accompanied by a sealed envelope addressed with same *nom de plume* and

enclosing the real name and address of the author. Three independent and capable judges will be selected to award the prizes ; and the papers receiving them will be the property of the journal offering the prizes. A circular giving fuller details can be obtained by application to Professor Harrington.

AMERICAN PUBLIC HEALTH ASSOCIATION.

Preliminary Circular :

The sixteenth annual meeting of this association will be held at

MILWAUKEE, WIS., NOVEMBER 20-23, 1888.

The Executive Committee have selected the following topics for consideration at said meeting :

- I. The Pollution of Water-Supplies.
- II. The Disposal of Refuse Matter of Cities.
- III. Animal Diseases Dangerous to Man.
- IV. Maritime Quarantine, and Regulations for the Control of Contagious and Infectious diseases, and their Mutual Relations.

Precedence will be given papers upon the above subjects, although other papers of a sanitary nature will be received by the committee. The topics given indicate the subjects which it is desired to consider, yet they are not to be regarded as the exclusive topics of the meeting. Papers of ability and practical application upon any subject connected with the public health interests will be received.

THE LOMB PRIZE ESSAYS, 1888.

Mr. Henry Lomb, of Rochester, N. Y., now well known to the American public as the originator of the "Lomb Prize Essays," offers, through the American Public Health Association, two prizes for the current year, on the following subject :

Practical Sanitary and Economic Cooking Adapted to Persons of Moderate and Small Means.

First Prize, \$500. - - - Second Prize, \$200.

Conditions : The arrangement of the essay will be left to the discretion of the author. These essays are, however, expected to cover, in the broadest and most specific manner, methods of cooking, as well as carefully prepared receipts, for three classes—(1) those of moderate means ; (2) those of small

means ; (3) those who may be called poor. For each of these classes, receipts for three meals a day for several days in succession should be given, each meal to meet the requirements of the body, and to vary as much as possible from day to day. Formulas for at least twelve dinners, to be carried to the place of work, and mostly eaten cold, to be given. Healthfulness, practical arrangement, low cost, and palatableness should be combined considerations. The object of this work is for the information of the housewife, to whose requirements the average cook-book is ill adapted, as well as to bring to her attention healthful and economic methods and receipts.

All essays written for the above prizes must be in the hands of the Secretary, Dr. Irving A. Watson, Concord, N. H., on or before October 15th, 1888. Each essay must bear a motto, and have accompanying it a securely sealed envelope containing the author's name and address, with the same motto upon the outside of the envelope.

INTERNATIONAL CONGRESS OF MEDICAL JURISPRUDENCE.—*The Medico-Legal Society of New York* has decided to hold an International Congress of Medical Jurisprudence in the city of New York during the year 1889, at which representatives from all countries will be invited to attend and contribute papers. It is proposed that the Congress shall continue four days—the time of meeting to be determined hereafter. Arrangements will be made for reduced fare.

All foreign delegates and invited guests from abroad, and all members of the society residing in the various States of the Union and the Canadas will be entertained by the resident members as invited guests.

The leading societies, home and foreign, who are pursuing kindred studies are invited to send delegates.

The General Committee of Arrangements will be announced later, as soon as formed.

The Sub-Committee, which now has the affair in charge, is composed as follows :

Moritz Ellinger, Esq., Chairman ; Clark Bell, Esq. ; Dr. Isaac Lewis Peet ; Stephen Smith, M.D. ; Judge Noah Davis, and E. W. Chamberlain, Esq.

Moritz Ellinger, Corresponding Secretary of the Medico-Legal Society, New York.

THE UNITED STATES MUTUAL ACCIDENT ASSOCIATION, New York, has received *Certificate of Authority* from the State of Missouri for the prosecution of its beneficent purpose in that State, the personal examination of the affairs of the company by the superintendent of the Insurance Department having proved in the highest degree satisfactory. The Insurance Department finds that

“The system of checks adopted in carrying out the detail of current office work is ample to detect error in any direction, and to protect the company, its officers, and members in all their relations with one another,” and is “satisfied that the business of the company from its organization to the present time has been honestly and judiciously administered, and that its whole system of accounts and the intercourse of its managers with its members are compact and under a method not easily to be improved upon.”

“RUM is nothing else than molasses brandy,” says Dr. E. Chenery, in his “Studies of Alcohol” (*Medical Register*, September 1st, 1888). He should have said *New England* rum, which differs as much from West India rum as New Jersey cider differs from champagne. West India rum is distilled from syrup scum—the fermented skimmings of the sugar boilers—and fresh cane juice, and contains the volatile and essential oils peculiar to sugar-cane, which give it a flavor and other qualities exceedingly different from that which is distilled from molasses. Moreover, in Jamaica, where the best rum is made, it is the usual practice to put sliced pineapples into the puncheons containing the finest quality, and this is sometimes called pineapple rum. But of all alcoholic liquors, rum most improves by age. When new it is peculiarly pungent and inordinately intoxicating. By long keeping, however, it loses the pungent spirit, and by combination acquires œnanthic ether, which softens and improves the flavor and greatly improves the quality. It is, in our judgment, the least injurious of alcoholic liquors and the best for medical purposes; is, indeed, the only one with diaphoretic properties, and, hence, beneficial in cases of extreme exhaustion and hot skin when other alcoholics are aggravating.

THE PROGRESS OF INFECTIOUS DISEASES AND MORTALITY
RATES AT THE MOST RECENT DATES, BASED UPON OFFI-
CIAL AND OTHER AUTHENTIC REPORTS.

YELLOW-FEVER'S continuous spread in Florida, under the congenial influence of climate and favorable local conditions, and the feeble efforts that have been made for its prevention since the time of its neglectful introduction at Key West and Tampa, nearly eighteen months ago, is perfectly consistent with the nature of the disease everywhere. Being effectually introduced, the outbreak began during the early hot weather, in May, 1887, and continued until it was suspended by cold weather—just as it is annually in Vera Cruz by the setting in of the *northers*. Under date of January 18th, 1888, the Florida Health Protective Association announced that no yellow-fever existed at that time in the State. But the again recurring season of warm weather, in May of this year, proved to the contrary. Tampa, where, as we have before taken occasion to point out, the fever was treated so leniently at the outset, proved to be a good harbor, and under the repeated assurances of those in authority there, that it had been effectually stamped out, unrestrained travel and commerce was kept up between that and other congenial places, and that the germs of the disease should have thus speedily found access to Jacksonville is surely no matter of surprise to persons conversant with the subject who have watched its progress.

By the latest official reports of Surgeon-General Hamilton, at the time of this writing :

" *Jacksonville, Fla.*, September 7th : For 24 hours ending 6 P.M., new cases, 77 ; deaths, 8. Total cases to date, 511 ; total deaths, 60. The number of cases under treatment is no longer furnished in the despatches.

" *Tampa, Fla.*, September 4th : 7 cases reported in last two days ; 4 positive ; mostly mild type. No deaths.

" *Manatee, Fla.*, September 4th : One isolated case ; Palmetto, one case on 31st ; 14 in all to date. River villages healthy. Total cases recorded, 31. Last one on 24th."

" August 31st, 1888. A sanitary inspection is *now*" (the italics are ours) " being conducted under the direction of this bureau, with a view of obtaining definite information from

other places in Florida, and removing, if possible, restrictions from places not infected."

Although every municipal and even village government in the United States exercises at will the power of isolating persons sick with infectious diseases, removing the well from and of promptly disinfecting dangerous localities and fomites for the protection of the public, the National Health Service, with unlimited means and power, as at present constituted, dallies with the most commerce disturbing and one of the most dangerous of infectious diseases until such time as it will cost more thousands of dollars to suppress it than it would have cost hundreds by timely measures, to say nothing of the protracted suffering and loss of life. This practice is the less excusable, because examples of easy recollection are not wanting of the success of the energetic measures, under different auspices, practised in Memphis; and of the more recent, but exceedingly different measures practised at Brownsville under the same auspices as now obtain, and which promise similar coincident results—suspension of the fever by the setting in of frosty weather, or when it shall have exhausted itself for the want of fresh subjects.

Had Surgeon-General Hamilton taken such action with the population of Key West and Tampa in May, 1887, as his letter "To the Public," September 2d, 1888, appears to contemplate with regard to the less wieldy population of Jacksonville, he would probably not have encountered the obstacles which now beset him, and Florida and other communities would have escaped the losses and inconveniences due to the delay and consequent increased magnitude of the undertaking. And, moreover, the permanent foothold of the disease in Florida and its annual recurrence there hereafter would have been rendered far less probable than now appears.

Havana: Deaths reported from yellow-fever during the three weeks ending August 31st, 76.

CALIFORNIA.—The Secretary of the State Board reports the number of deaths during July, 1888, from 85 localities, comprising a population of 707,850, 958, representing an annual death-rate of 16.08 per 1000.

Consumption is credited with 137—a decrease of 19 from

June report ; pneumonia, 46 ; bronchitis, 16 ; congestion of the lungs, 7.

Zymotic diseases, 220 : Diphtheria, 37 ; typhoid-fever, 35 ; cerebro-spinal-fever, 12 ; scarlet-fever, 7 ; measles, 2 ; remittent and intermittent-fevers, 10 ; whooping-cough, 13 ; *small-pox*, 2—in San Francisco.

San Francisco, 300,000 : Deaths during the month, 519—from zymotic diseases, 112 ; consumption, 72 ; acute lung diseases, 54.

Los Angeles, 70,000 : 36 ; from consumption, 4 ; acute lung diseases, 1.

Oakland, 50,000 : 75 ; from consumption, 6 ; acute lung diseases, 3.

San Diego, 32,000 : 33 ; from consumption, 3 ; acute lung diseases, 1.

Sacramento, 30,000 : 37 ; from consumption, 4 ; acute lung diseases, 2.

CONNECTICUT.—The Secretary reports for July, 1888, the total number of deaths returned by 163 towns, comprising a population of 720,551, 1151, representing an annual death-rate of 19.1. Deaths under five years, 493—42.8 per cent.

“ Small-pox. But one case has occurred during the month, that of a new-born contracted from its mother and died.

“ Scarlet-fever occurred in Branford, Bridgeport, Hartford, Madison, Middletown, Norwalk, and Stonington, with 11 fatal cases—7 towns as against 13 in June.

“ Diphtheria. Reported from Bridgeport, Bristol, Danbury, Derby, East Windsor, Enfield, Farmington, Greenwich, Hartford, Litchfield, Meriden, Middletown, New Hartford, New Haven, Norwalk, Norwich, Scotland, Stamford, Suffield, Waterbury, Waterford, and Windsor Locks, with 37 deaths—22 towns as against 14 in last month.

“ Typhoid-fever was mentioned as present in Danbury, Hartford, Guilford, Killingworth, Manchester, Naugatuck, New Britain, Portland, Wallingford, Waterbury, and Windham, with 14 deaths—11 towns against 9 in June.

“ While the sickness and mortality was very decidedly greater in July than in the month before, yet in comparing the health of the people with July of the previous year, it will be found to present a very favorable showing.”

The *lowest death-rates* of the 28 towns with 5000 inhabitants and upward were in Groton, 6.85 ; Vernon, 7.5 ; Bristol, 7.38 ; Manchester, 8.33 ; Killingly, 9.

The *highest death-rates* of the 28 towns with 5000 inhabitants and upward were in Danbury, 28.6 ; Windham, 27.6 ; Bridgeport, 26.7 ; Naugatuck, 26 ; Hartford, 25.2.

New Haven Board of Health reports for 1887 : Births, 2357 ; marriages, 824 ; deaths, 1444. " This board was organized in 1872, when the population was but 55,000 and the death-rate for the five years, beginning then, was 22.34, 21.70, 18.24, 20.55, and 20.48 respectively, an average for the five years of 20.62. Now we have a population of at least 80,000, and the death-rate for the last five years has been respectively but 18.65, 18.37, 17.55, 17.53, and 18.05, an average of but 18.03. These figures are eloquent, they mean over 200 lives now saved each year, and if we go back and compare with the earlier years, the saving is still more striking—486, 33.5 per cent, of the deaths during 1887 were of children under five years ; 254, 17.58 per cent, were caused by zymotic diseases, and 201 13.9 per cent, by consumption.

ILLINOIS.—*Chicago* Department of Health, Oscar C. de Wolf, M.D., Commissioner, reports for 1887 : Population, 760,000 ; deaths, 15,409—7568, 49.1 per cent, were of children under five years ; death-rate, 20.21—4164, 26.38 per cent, were caused by zymotic diseases.

The number and percentage of the total number of deaths from the more important zymotic diseases were as follows : Diarrhoeal diseases, 1419, 8.58 per cent ; croup and diphtheria, 1405, 9.12 ; typhoid-fever, 381, 2.47 ; measles, 341, 2.21 ; scarlet-fever, 190, 1.23 ; small-pox, 2.

Deaths from consumption, 1352, 8.77 per cent of total.

" The amount and character of sanitary work accomplished during the year has never been equalled in the department. The construction of a garbage furnace capable of consuming 150 tons daily of garbage and rubbish is an epoch in our sanitary history. The furnace is fully described in the report of Assistant Commissioner Thompson, who has had charge of the work.

The Garbage Furnace is the Mann patent. " The furnace has double the capacity of the one in Montreal, and is in all

respects a double furnace with chimney in the centre and built with twice the capacity that was originally intended and is the largest furnace for the destruction of garbage in the country to-day. The dimensions are : length, 69 feet ; width, 18 feet and 8 inches ; height, 21 feet. At the extreme ends of the furnace the fire is made which passes under the grate upon which the garbage is thrown. There are three, one large and two small, furnaces for burning garbage, and midway between them is located the smoke-stack, which is 42 inches in diameter inside and 90 feet high. The south furnace is exactly twice the size of those in the north section. In the middle of the south furnace is a building wall 18 inches thick, which is just as high as the grate bars, or 3 feet above the base of the furnace. On either side of this wall is a heavy iron beam, and on the wall and these beams rest 4 heavy sets of iron bars $1\frac{1}{2}$ inches apart. There are 48 bars in each set, which are movable at will. The north section is divided into two sections or furnaces, and is separated by a 17-inch wall of fire-brick. The original intention was to have but two large furnaces, but experience demonstrated the fact that more garbage could be destroyed by dividing the furnace. The side walls of the garbage furnaces and the arch overhead are 28 inches thick and of the best fire-brick. This is necessary to hold the heat and stand the intensity of it. There are three tiers of doors opening into the crematory. The upper one is for receiving the garbage, the middle one for stirring the material, the lower or bottom tier for taking out the ashes and debris of the burned garbage. The whole structure is enclosed with a frame building 90 feet long, 52 feet wide, and $28\frac{1}{2}$ feet high. The roof of the building is flush with the street, that the wagons may drive upon and discharge their loads into chutes, which deposit the material upon an iron platform immediately in front of the doors, where a man stands to receive, separate, and feed the fire. Eight wagons can be unloaded at the same time. . . . At present we are destroying 50 cubic yards daily, and could just as well burn three times as much. The furnaces work perfectly satisfactory and meet my expectations, except in the matter of fuel. It was originally estimated that it would require about four tons of soft coal daily to run at full capacity. I am now convinced that it will require seven tons a day. . . . We started out with the idea of erecting a furnace large enough

to burn all the garbage of the West division, and I think we have that capacity."

For the month of July, 1888, population, 802,651 : Deaths, 1806—1156 under five years of age. Annual death-rate, 27.09 per 1000. From zymotic diseases, 727 deaths, and from consumption, 112.

INDIANA.—*Sixth Annual Report of the State Board of Health for the fiscal year ending October 31st, 1887*, pp. 342. "Within the year embraced in this report the members of the Board have made sanitary inspections of penitentiaries, jails, county poor asylums, together with all the State benevolent institutions. It is believed that these inspections have aroused a general interest in those who have charge of these institutions, and that much good has been accomplished." Reports in detail of these inspections follow, which show great need of practical work in this direction. Ninety-two counties of the State have organized boards of health in accordance with the law : "The county commissioners, with a physician, who is annually selected in the month of January to fill the position of secretary, constitute these various boards." But inasmuch as the county commissioners are usually composed of men who have no knowledge of preventive medicine, and the secretary is commonly chosen according to his political affiliation and efficiency, and his willingness to fill the office at a price fixed by officials who set a higher value upon the life of a pig than of a baby, and the keeper of a village pound for stray animals than of the health officer—not peculiar to Indiana, however—such "boards of health" are unworthy the name and better calculated to disgrace than to promote the health service anywhere. Notwithstanding, of about 30 county reports, most of them show an interest greatly out of proportion with the inducements for such co-operative work ; and these reports are eminently suggestive of the higher plane of organization of the county boards which the Secretary of the State Board urges as absolutely essential for effective service.

The secretary submits a tabulated statement of marriages, births, and deaths throughout the State, but confessedly so incomplete as to be of but little value. The law for this service, like that for the organization of the county boards of health, is inadequate to its intended purpose.

Indianapolis is reported by Dr. S. E. Earp, Secretary of the Indianapolis Board, for nine months ending October 31st, 1887, who shows specially creditable results in the reduction of the death-rate from 24.83 in 1873 to 14.54 in 1888—less than at any time since the organization of the Board of Health. During the first five years of the period the death-rate was respectively : 24.83, 25.65, 27.83, 25.50, 22.84. During the last five years : 19.62, 19.39, 16.43, 15.62, 14.54. During which period, 1873 to 1888, the population has more than doubled, risen from 56,100 to 117,000.

Appended are a number of brief essays by members of the board and other contributors, the Lomb Prize Essay on Disinfection and Disinfectants, and Proceedings of the National Conference of State Boards of Health—all of more or less additional practical value to the effective work of the board, for distribution among the people in promotion of its purposes. The report as a whole fully justifies the secretary's recommendation that the number of copies of the State Board's annual report, now limited to 3000, should be greatly increased for public benefit.

IOWA.—*Monthly Bulletin* reports for July, 1888 :

Burlington : Deaths, 20 ; from consumption, 1 ; annual death-rate per 1000, 7.94.

Keokuk : Deaths, 12 ; from consumption, 1 ; monthly death-rate per 1000, .85.

Davenport : Deaths, 29 ; from diphtheria, 5 ; consumption, 1 ; annual death-rate, 11.97.

Dubuque : Deaths, 36 ; annual death-rate, 12.34.

LOUISIANA.—*New Orleans*, 248,000 : Reports for July, 1888, 577 deaths, of which 245 were under five years of age. There were 384 deaths among the whites and 193 among the colored. The respective death-rates were 25.55 and 32.58 ; and for the total population, 27.90 per 1000. Deaths from zymotic diseases numbered 127, and from consumption, 66.

MASSACHUSETTS.—*Boston*, 415,000 : Reports 830 deaths during July, of which 384 were under five years of age. Annual death-rate, 24.0 per 1000. There were 240 deaths from zymotic diseases, and 115 from consumption.

MARYLAND.—*Baltimore*, 431,879 : Reports for four weeks ending July 28th, 967 deaths, of which 590 were under five years of age. Annual death-rate per 1000, 28.8. From zymotic causes there were 447 deaths, and from consumption, 71.

MICHIGAN.—The Secretary of the State Board reports for the month of July, 1888, compared with the preceding month, that diarrhœa, dysentery, cholera morbus, and cholera infantum increased, and that measles, rheumatism, inflammation of kidney, erysipelas, pneumonia, and tonsilitis decreased in prevalence.

Compared with the preceding month, the temperature in the month of July, 1888, was higher, the absolute humidity was about the same, the relative humidity was the same, the day ozone was slightly more, and the night ozone slightly more.

Compared with the average for the month of July in the nine years 1879-87, intermittent-fever, remittent-fever, diarrhœa, cholera morbus, diphtheria, cholera infantum, tonsilitis, and consumption of lungs were less prevalent in July, 1888. There was no disease reported more than usually prevalent in July, 1888.

For the month of July, 1888, compared with the average of corresponding months in the nine years 1879-87, the temperature was slightly lower, the absolute humidity was about the same, the relative humidity considerably less, the day and the night ozone were considerably less.

Including reports by regular observers and others, diphtheria was reported present in Michigan in the month of July, 1888, at 21 places, scarlet-fever at 17 places, typhoid-fever at 15 places, measles at 22 places, and small-pox at 1 place.

Reports from all sources show diphtheria reported at 2 places more, typhoid-fever at 5 places more, scarlet-fever at 13 places less, measles at 20 places less, and small-pox at the same number of places in the month of July, 1888, as in the preceding month.

Detroit, 230,000 : Reports for July 458 deaths, of which 314 were under five years of age. Annual death-rate, 23.44 per 1000. Zymotic diseases caused 213 deaths, and consumption, 25.

MINNESOTA.—*St. Paul*, 175,000 : Reports 263 deaths during July, 204 being under five years of age. Annual death-

rate per 1000, 18.03. From zymotic diseases 126, and from consumption, 17.

MISSOURI.—*St. Louis*, 440,000 : Reports 885 deaths during July, of which 454 were under five years of age. Annual death-rate, 24.14 per 1000. From zymotic diseases there were 275 deaths, and from consumption, 62.

NEW JERSEY.—*Hudson County*, 270,232 : Reports for July 572 deaths—339 under five years of age. Annual death-rate, 25.4 per 1000. Zymotic diseases caused 239 deaths, and consumption, 32.

NEW YORK.—Official *Bulletin* of the State Board of Health reports the total mortality from the returns of 128 localities, comprising a population estimated at 3,822,300, for the month of July, 1888, 10,300, representing an annual death-rate per 1000 of 18.72 (16.82 in June). The proportion of deaths from zymotic diseases is increased, being 380.00 per 1000 deaths from all causes (227.34 in June) ; the increase is from diarrhœal diseases, which caused more than 75 per cent of the zymotic mortality (82 per cent in July, 1887, and nearly 29 per cent of the total mortality. Deducting the increase in the number of deaths from diarrhœal diseases over last month from the total mortality, the number of deaths is less than in June. There is slight increase in deaths from typhoid-fever and also from whooping-cough ; from scarlet-fever, measles, and diphtheria the actual mortality is materially diminished. From small-pox but two deaths are reported, one being from Buffalo, where it developed in July, among Polish Jews, by whom it was imported, 14 cases having occurred up to August 2d, when it was believed to be under control. From consumption there were 93.78 deaths per 1000 total mortality, and 193.64 per 1000 above five years of age.

Severally, the populations and death-rates are as follows :

Maritime District.—New York City, 1,526,081, 32.86 ; Brooklyn, 757,755, 32.67 ; Gravesend, 5000, 54.00 ; New Utrecht, 4742, 40.50 ; Long Island City, 21,000, 48.00 ; Newtown, 10,000, 54.00 ; Oyster Bay, 12,000, 17.00 ; Hempstead, 18,000, 30.33 ; North Hempstead, 8000, 30.00 ; Huntington, 8100, 22.47 ; Jamaica, 10,089, 19.64 ; Southold, 7267, 14.85 ; Sag Harbor, 3000, 16.00 ; New Brighton, 15,000, 35.20 ; Edgewater, 12,000, 24.00 ; Northfield, 7014, 24.00 ; Westfield, 7000,

18.85 ; Yonkers, 27,500, 36.92 ; Westchester, 6900, 29.18 ; Sing Sing, 6500, 38.77 ; New Rochelle, 5500, 34.21.

Hudson Valley District.—Albany, 98,000, 25.22 ; Troy, 65,000, 31.99 ; West Troy, 13,000, 20.30 ; Hoosick Falls, 6000, 22.00 ; Lansingburg, 10,000, 28.80 ; Green Island, 5000, 26.40 ; Greenbush, 8000, 19.50 ; Coxsackie, 4000, 21.00 ; Catskill, 4500, 24.00 ; Hudson, 10,000, 16.80 ; Kingston, 21,000, 23.43 ; Ellenville, 3000, 12.00 ; Marbletown, 4000, 6.00 ; Esopus, 4736, 15.20 ; Saugerties, 4000, 12.00 ; Poughkeepsie, 20,200, 19.00 ; Fishkill, 10,732, 10.50 ; Wappinger Falls, 5000, 7.20 ; Newburg, 20,000, 36.60 ; Port Jervis, 9500, 20.21 ; Middletown, 10,000, 27.60 ; Goshen, 4387, 27.30 ; Ramapo, 5000, 16.80 ; Haverstraw, 7000, 27.43.

Adirondack and Northern District.—Argyle, 3700, 3.25 ; Salem, 3500, 17.12 ; Fort Ann, 4267, 5.55 ; Fort Edward, 4880, 22.13 ; Glens Falls, 10,000, 22.80 ; Crown Point, 4287, 14.00 ; Malone, 9000, 21.26 ; Potsdam, 4000, 21.00 ; Ogdensburg, 11,000, 25.09 ; Gouverneur, 5500, 8.72 ; Plattsburg, 7000, 15.43 ; Watertown, 12,200, 22.64 ; Lowville, 3188, 22.58 ; Clayton, 4314, 19.53.

Mohawk Valley District.—Schenectady, 20,000, 20.40 ; Schoharie, 3350, 17.17 ; Cobleskill, 3371, 10.68 ; Amsterdam, 14,000, 28.28 ; Johnstown, 6000, 20.00 ; Gloversville, 10,000, 10.80 ; Little Falls, 7200, 20.00 ; Ilion, 4200, 11.43 ; Utica, 43,000, 24.60 ; Rome, 12,045, 19.00 ; Boonville, 4000, 9.00 ; Camden, 3400, 28.26 ; Waterford, 5400, 24.44 ; Ballston Spa, 3200, 11.25 ; Saratoga Springs, 10,000, 40.80.

Southern Tier District.—Binghamton, 25,000, 12.80 ; Owego, 6000, 16.00 ; Candor, 4323, 11.12 ; Waverly, 3000, 28.00 ; Elmira, 25,000, 13.44 ; Horseheads, 3500, 20.57 ; Bath, 3500, 17.1 ; Corning, 8000, 24.00 ; Olean, 8000, 19.50 ; Salamanca, 6000, 12.00 ; Jamestown, 14,000, 13.60 ; Westfield, 3000, 16.00.

East Central District.—Walton, 3540, 10.17 ; Delhi, 3000, 12.00 ; Cooperstown, 3000, 8.00 ; Oneonta, 7000, 18.85 ; Worcester, 3000, 16.00 ; Cazenovia, 4363, 11.00 ; Brookfield, 3685, 6.51 ; Hamilton, 3912, 12.30 ; Baldwinsville, 3000, 12.00 ; Skaneateles, 4866, 14.78 ; Syracuse, 80,000, 24.00 ; Cortland, 9000, 9.33 ; Homer, 3000, 8.00.

West Central District.—Auburn, 26,000, 14.31 ; Ithaca, 10,000, 13.20 ; Waterloo, 4500, 16.67 ; Hector, 5000, 14.40 ;

Manchester, 4000, 9.00 ; Phelps, 7000, 18.85 ; Geneva, 6000, 20.00 ; Penn Yan, 4500, 10.67 ; Dansville, , 22.70.

Lake Ontario and Western District.—Oswego, 24,000, 16.00 ; Richland, 4000, 3.00 ; Fulton, 4000, 12.00 ; Clyde, 3000, 24.00 ; Lyons, 6000, 14.00 ; Newark, 3500, 24.00 ; Palmyra, 4800, 15.00 ; Rochester, 110,000, 24.20 ; Brockport, 4500, 8.00 ; Medina, 4000, 6.00 ; Albion, 5000, 24.60 ; Buffalo, 230,000, 25.00 ; Tonawanda, 4900, 31.00 ; Amherst, 4578, 13.20.

Brooklyn's Annual Report for 1887, a pamphlet of 145 pages, gives favorable results, though less complete in vital statistics than desirable, as compared with the previous reports of the same department or those of other large cities.

"The work of a purely sanitary nature is supervised by medical and other inspectors appointed under the Civil Service Regulations, for that special service." But besides these the commissioner adds :

"Of our various efforts for the preservation of health and life, the operations of our *summer corps* of competent physicians in supervising the dwellings in the tenement districts and giving gratuitous advice and medicines when required are among the most important. . . . It was put in operation July 1st, and continued until October 1st. The duties as described have been fully carried out, and have been productive of many good results. The welcome with which these physicians are received is ample testimony to the usefulness of their efforts, while the amount of suffering they relieve and the hope and comfort they impart are of incalculable benefit." By which it appears, as we have taken occasion before to observe, *this* temporary corps is the only one engaged in *seeking out* the causes of sickness before their results are reported.

The corps of sanitary inspectors, appointed under the Civil Service Rules, is a very different force. It consists of trained men, supposed to be specially competent to recognize nuisances of all kinds and other likely causes of sickness. Logically, they are supposed to be more or less continuously occupied in examining their respective districts, house by house and street by street and all the premises round about ; to be familiar with the water-supply and connections, drains, privies, and all the conditions, general and particular ; and in every

case, when any discoveries are made in conflict with health, if the defects depend upon the occupant, to give prompt notice and direction for their abatement and see to it that the conditions, discoveries, and disposals recommended are matters of report and record at headquarters. Such service, supplemented with that which obtains instead—namely, response to special complaints and reports made by private individuals in his district—would go far toward making every sanitary inspector a known quantity, contributory to the work of the Department, and co-ordinate with inspectors of definite designation and significant of a sphere of duty. But the sanitary service of Brooklyn is no exception in this respect. So far as we have been able to learn, quite as much is required of the sanitary inspectors here as elsewhere. Their office is chiefly perfunctory, but worth about all that is paid for it. When more value is put upon human life, its protection will be more highly esteemed and the labor of those competent to protect it will be more equitably remunerated.

The Food Supply has very properly been among the foremost subjects of the administration, and required the largest number of employés for its conservation.

The Chief Chemist reports 7 samples of lager beer out of 17 examined adulterated with salicylic acid; 14 samples of French peas contained copperas; 2 samples of ice-cream colored with aniline green; 1 sample of ice-cream flavored with essence of bitter almonds; 4 samples of candies colored with chrome yellow; 5 samples of macaroni colored with saffron, turmeric, and Martin's yellow. It is not stated *how many* samples were examined for these results. "Likewise," with regard to meat, fruit, and vegetable inspections. "No accurate account was kept of the amount of these miscellaneous articles destroyed, but the quantity would be measured by tons, and in some instances by truck-loads. A very large amount of deleterious food has thus been prevented from reaching consumers. . . . This is attributable to two principal causes. While a part of it is due to the efforts of this department in securing the destruction of a large part of this deleterious food, no doubt a large part of it is due to the education of the people to greater care in selecting wholesome articles."

Milk continues to require vigilance against venal venders

notwithstanding the conviction and fines of 63 culprits out of 2683 inspections during the year. Evidently the usual fine imposed, \$25, is too small.

The Chief Inspector of Plumbing reports 10,130 inspections on new work—with a view to conformity with regulations—and 9552 nuisances abated in old work ; and the records of his bureau at all times presentable for the satisfaction of tenants.

The removal of garbage, ashes, dead animals, and night soil is said to be satisfactorily performed under existing arrangements and contracts, though correspondence is in progress with a view to possible crematory apparatus adequate to this purpose.

The Secretary (and Registrar of Vital Statistics) reports :

Total number of deaths during the year, 17,078, 22.72 per 1000 of population (774,870). But in other respects this supplement to the general report is very meagre. Births, marriages, and still-births recorded up to December 1st, 1887, 11,208, 4908, 1196 respectively, are added, but for the rest, the reader is referred to other reports which have been or which hereafter are to be made ; *annual* report thus losing its significance.

A large increase in the number of cases of contagious diseases is reported by the clerk of this department as compared with the preceding year or any corresponding period, but the proportion of deaths from them was 10 per cent less than during the year 1886. These differences are attributed to more rigid exactions of all physicians to promptly report such cases.

The prevention of such diseases has been the constant effort of the department, by the circulation of leaflets of information and otherwise, and by prompt exclusion of school children and others from contact with the well. Vaccination has been persistently urged and practised upon all unprotected persons who could be made to submit to it, in conjunction with the segregation and general surveillance of and over all cases of small-pox and unprotected persons known to have been exposed to it ; and all infected material promptly destroyed or disinfected. Yet the disease gave much trouble and lasted throughout the year. Total number of cases reported : First quarter, 119 ; second, 53 ; third, 5 ; fourth, 17 : 194.

A contagious diseases hospital continues to be *the* desideratum, promising to greatly increase the efficiency of the service for the prevention of communicable diseases ; and since the means are now provided by law, it will doubtless, ere long, be provided.

Rochester Board of Health reports for the year ending April 1st, 1888 : Population, 120,000 ; marriages, 1147 ; marriage-rate, 9.56 ; births recorded, 2187 ; birth-rate, 18.22 ; deaths, 2076 ; death-rate, 17.3. Of the deaths, 745, 35.88 per cent, were of children under five years ; 467, 22.5 per cent, were caused by zymotic diseases, and from consumption not stated.

OHIO.—*Columbus* reports for the year ending March 31st, 1888 : Population, 90,000 ; deaths, 1220 ; death-rate, 12.72. Deaths from zymotic diseases, 266, 21.8 per cent of total ; 201, or 16.47 per cent, were caused by consumption ; 205, or 16 per cent, were of children under five years.

Dayton reports for the year 1887 : Population, 52,000 ; deaths, 754 ; death-rate, 14.50. Deaths from zymotic diseases, 157, 20.8 per cent of total ; 108, or 14.3 per cent, were caused by consumption ; 269, or 35.5 per cent, were of children under five years.

Toledo reports for 1887 : Population, 76,000 ; deaths, 1037 ; death-rate, 13.64. Deaths from zymotic diseases, 265, 25.5 per cent of total ; 123, or 11.8 per cent, were caused by consumption ; 423, or 40.8 per cent, were of children under five years.

PENNSYLVANIA.—*Philadelphia*, 1,016,758 : Reports 1787 deaths for four weeks ending July 28th, of which 926 were under five years of age. Annual death-rate, 23.07 per 1000. There were 473 deaths from zymotic diseases, and 186 from consumption.

Pittsburgh, 230,000 : Reports for four weeks ending July 28th, 387 deaths—200 under five years of age. Annual death-rate, 22.0 per 1000. There were 200 deaths from zymotic diseases, and 29 from consumption.

RHODE ISLAND.—*Annual Report of the State Board of Health for the year ending December 31st, 1887, and including the Report upon the Registration of Births, Marriages, and Deaths in 1886.* Pp. 150 and 192.

In the introductory sketch of the most common preventable diseases—cholera infantum, croup, diphtheria, diarrhœa, and dysentery, intermittent-fever, measles, scarlet-fever, typhoid-fever, and whooping-cough—croup and diphtheria are described and their relative prevalence compared as distinct diseases, as, indeed, they continue to be by many health officers, notwithstanding the conflicting alleged marks of distinction and the now general conclusion of authorities that the symptoms, taken altogether, are of one and the same disease under two names. Croup (*crupe*, to crow or croak), a hoarse, ringing cough, one of its symptoms, not always being present, and not pathognomonic when it is—because it sometimes occurs under wholly different conditions—should be dropped from the nomenclature of diseases.

Probably owing to the progress of knowledge among physicians in this regard: "Since 1875 cases of diphtheria have far exceeded those of croup, and for the last eleven years deaths by this disease have outnumbered those by croup by more than two to one."

The number of deaths from croup in 1886 was 90; from diphtheria, 228. The number from diphtheria was the largest since 1879, and of any year except that and of the two next preceding years (respectively, 1877, 492; 1878, 435) ever reported. For twenty-nine years, for every 160 deaths reported from diphtheria there have been 100 from croup; and in 1887: "According to the reports from medical correspondents, diphtheria appears to be upon the increase in nearly all parts of the State."

Diarrhœal diseases appear to have been nowhere epidemic during the year 1887. Cholera infantum was reported quite severe in Warwick, in the neighborhood of certain factory villages—where there was "no work for the promotion of public health, except by introduction of water service in the village of Phenix" (with the usual effect of introducing water when there is) . . . "no public sewerage. . . . Taking sickness of all kinds, there has been about one third more than usual in this circuit during the year." In 1886 the proportion of deaths from cholera infantum* to total mortality was 6.27 per cent—greater by 1.19 per cent than the average for twenty-two years.

Measles were epidemic in the village of Natick in Warwick ; Providence ; Kingston and Wakefield in South Kingston ; Johnston and Newport. "In Providence the number of deaths was the largest in a single year. . . . The whole amount of sickness of all kinds in this city during 1887 was at least ten per cent more than usual, allowing for increase of population." In 1886 the number of deaths from measles in the State was 18.

"Scarlet-fever became epidemic in the towns of Gloucester, Scituate, and South Kingston in 1886 ; still largely prevailing in two or three other towns and lessening in severity in Westerly. . . . We cannot as yet judge whether the epidemic is upon the wane." In 1886 the number of deaths from this disease in the State was 88.

Whooping-cough was but slightly prevalent during the year 1887—epidemic solely in Warwick at the village of Natick. Providence and Newport had the greatest number of deaths, respectively 12 and 2. In 1886 the number of deaths in the State from this disease was 49.

Intermittent-fever is said to be increasing in fatality. In Providence alone there were 28 deaths (in 1887) to 11 in 1886—only 6 less than were reported throughout the State in 1885. Since 1882 the increase each year in the whole State has been nearly 25 per cent, and in Providence alone upward of 40 per cent. In 1886 the number of deaths as tabulated from intermittent and malarial-fevers in the whole State was 43. Typhoid-fever has been unusually absent during the year, except in Warwick, Scituate, and in one hotel at Conanticut Park. "Sanitary measures have undoubtedly much to do with this exemption." During the year 1886 the number of deaths in the State reported from this disease was 169—2.9 per cent of the total mortality, the average for twenty-two years being 3.6 per cent.

The aggregates of statistics for the year 1886 : Marriages, 2750 ; divorces, 257—1 to every 10 $\frac{7}{10}$ marriages ; births, 7621—birth-rate, 24.5 ; deaths, 5849—death-rate, 18.8. Average rates for seven years : Marriage, 18.4 ; birth, 24.0 ; death, 17.9 ; excess of birth-rate over death-rate, 6.1.

Causes of Death : Zymotic diseases, 1283, 21.94 per cent ; constitutional, 1228, 20.92 ; local, 2346, 40.14 ; develop-

mental, 681, 11.66; violence and otherwise, 311, 5.34. Of the zymotic causes, 21.08 per cent were miasmatic, .55 enthetic, .28 dietetic, and .03 parasitic. Of the constitutional, 4.44 per cent were diathetic, 16.48 tubercular, 14.12 consumption; 31.7 per cent of the total number of deaths from all causes were under five years of age, and the average age of all decedents was 34.01—males, 33.02, females, 34.91.

Newport seems to have a board of health without functions. For although it has issued a report for 1887, "the meetings of the board have not been well attended during the year, no quorum, it is thought, having been obtained since June, unless possibly upon some one or two occasions," of which no record appears. This is attributed to no lack of interest on the part of the members of the board, but to it and the ordinances which it formulated by authority being wholly ignored by the Board of Aldermen, which exercises supervisory power.

"The year has been signalized by an epidemic of measles. . . . At a special meeting of the board on March 23d a communication was received from Mr. F. W. Tilton, of the Rogers High School, relating to the question of the attendance of scholars coming from houses in which this disease had broken out. The ordinance upon the subject, passed July 7th, 1885, required that no one living in an infected house should attend school for a considerable period; and as, owing to the great prevalence of the disease, this applied to a very large number of children, the board was requested to ask of the City Council some modification of it as far as it related to measles. The secretary was authorized to reply that it was not thought advisable to take any action at that time; but after a second letter from the Superintendent of Schools the board asked to be empowered to exercise some discretion in the matter. The City Council, however, decided to strike out measles altogether from the ordinance!"

There were 11 deaths from the disease—unfortunately, none of them aldermen—to say nothing of the suffering and probable maiming and other after effects of nearly 300 cases of this *restrainable*, if not, indeed, wholly preventable disease. From other zymotic diseases the number of deaths reported are as follows: Diarrhœal diseases, 29; croup and diphtheria, 6; scarlet-fever, 4; typhoid-fever, 4; whooping-cough, 2;

puerperal-fever, 2 : 58—19 per cent of the whole number of deaths reported, 304.

The secretary, William C. Rives, Jr., M.D., in concluding his report, remarks :

“ It must be acknowledged that at present Newport possesses a board of health that to a great extent is such merely in name. The board has no discretionary powers, and all questions of importance have to be referred to the Board of Aldermen, who still continue at times to act as a board of health, which fact in itself shows that the present board of health is intrusted with limited authority. Such powers as have been conferred upon it through ordinances and regulations are, as has been said, rendered nearly useless by the inability to enforce them without overcoming difficulties that it seems hardly practicable to overcome, in the existing state of affairs. . . .

“ Unless something is done to enable the board to achieve greater results, it is to be feared that it will be difficult to obtain members who will take any active interest in its work.”

That there should, indeed, be found in Newport or elsewhere any self-respecting physician willing to accept service at the hands of a board of aldermen so obtuse to the importance of protecting the public health as that of Newport appears to be, only illustrates the tolerance of ignorance in public officials by physicians with the hope that they may be able to do something for the promotion of the health of the people despite such ignorance. But when viewed in another aspect, that the people whom such volunteers would benefit are responsible for choosing such public functionaries, the right conclusion seems inevitable, that they, too, like their chosen representatives, are incapable of appreciating the motives of physicians in this regard, and are unworthy of any such consideration. In short, it is high time that physicians everywhere should have learned that if human health and life is worth preserving, the means to that end have a value which should be exacted ; and that those who offer to or render such service without reward belittle their profession and deserve no sympathy for incurring the contempt of ignorant and pretentious officials, who measure the motives of other men

by their own conscious impulses to accept office without pay with a view to the spoils. The SANITARY PROTECTION ASSOCIATION, on having secured, as it thought, a board of health with ordinances for the exercise of sanitary functions, shortly thereafter became moribund.

We are gratified to observe, however, by a recent editorial in the *News*, that the "Third Annual Report of the Board of Health" and a simultaneous proposition to establish a large cemetery within the drainage area of the city water-supply, in conjunction with "the danger of ploughing the city swill into the water-shed, as now permitted, of the free access of night soil and other fertilizers to the sources of supply, and of the alleged pumping of water for distribution from the lower pond below the dam," have somewhat aroused the Association from its lethargic condition.

The milk (and water) supply was also a subject of discussion. It was shown to be on a par with the unsanitary administration generally. "Credit was given to the board of health for its recent advance in publishing weekly the deaths that occur and their causes, whereby the community, through knowing the worst, need no longer dread lest something be concealed. It was regretted, however, that so fatal a controllable disease as diphtheria should still be permitted to exist, as at present, about the city, in default of what the Association has repeatedly urged upon the authorities—a proper 'isolation house.'"

A communication to the "Board of Health" was voted, urging its offices in the promotion of the public health, in the face of a city council which handicaps it and regards self-exhaustion, by the want of new subjects, as the best way of estopping an epidemic of measles.

Clearly, it would be an exercise of wisdom by those who resort to Newport, on account of the natural advantages which the situation affords, to adopt the custom of providing themselves with water filters, after the manner of the Buddhist mendicants, to whom we referred in July number; and as for the milk—not to use any.

Report for the month of June, population, 20,000: Deaths, 28—11 under five years of age. Death-rate, 16.8. Deaths from zymotic disease, 4; from consumption, 3.

TENNESSEE.—The State Board *Bulletin* reports officially the principal diseases named in the order of their greater prevalence in the State for July were malarial fevers, dysentery, diarrhoea, cholera infantum, cholera morbus, consumption, and pneumonia.

Typhoid-fever is reported in the counties of Anderson, Cannon, Davidson, Gibson, Hawkins, Henry, Knox, Macon, Maury, Pickett, Robertson, Shelby, Stewart, Sullivan, and Wayne. Whooping-cough in Franklin, Gibson, Grundy, Knox, Marshall, and Shelby. Scarlet-fever in Davidson, Franklin, Knox, and Shelby. Small-pox in Davidson, Obion, Rutherford, and Shelby. "On July 3d a real nest of this disease was detected in a negro family near the southern limit of the city of Nashville. So far there have been 16 cases and 1 death. On the 5th the president of this board was requested to attend a meeting of the city authorities, when action was to be taken in the premises, and invited to address the council." The result was a prompt appropriation of \$5000 and such energetic action by the State and local boards of health as to get complete control of the disease, with a fair prospect of its early extermination. Mumps in Marshall, Robertson, and Stewart. Diphtheria in Knox, Montgomery, and Shelby. Measles in Cannon and Rhea. Cerebro-spinal meningitis in Hawkins and Overton. Erysipelas in Gibson.

In the chief cities the respective annual death-rates for the month per 1000 of population are reported as follows :

Chattanooga, white,	15.50 ;	colored,	30.46 : 21.10
Clarksville,	" 12.00 ;	"	24.00 : 16.50
Columbia,	" 8.00 ;	"	30.00 : 16.80
Knoxville,	" 23.24 ;	"	22.08 : 23.01
Memphis,	" 25.36 ;	"	41.21 : 30.99
Nashville,	" 15.48 ;	"	39.10 : 23.94

Memphis.—Charles Dudley Warner, in *Harper's Magazine* for September, says : " Ever since Memphis took itself in hand with a new kind of municipal government, and made itself a healthful city, good fortune of one kind and another seems to have attended it. Abundant water it could get from the river for sewerage purposes, but for other use either extensive filters were needed or cisterns were resorted to. The

city was supplied with water which the stranger would hesitate to drink or bathe in, from Wolf River, a small stream emptying into the Mississippi above the city. But within the year a most important discovery has been made for the health and prosperity of the town. This was the striking, in the depression of the Gayoso Bayou, at a depth of 450 feet, perfectly pure water, at a temperature of about 62° , in abundance, with a head sufficient to bring it in fountains some feet above the level of the ground. Ten wells had been sunk, and the water flowing was estimated at ten millions of gallons daily, or half enough to supply the city. It was expected that with more wells the supply would be sufficient for all purposes, and then Memphis will have drinking-water not excelled in purity by that of any city in the land. It is not to be wondered at that this incalculable good fortune should add buoyancy to the business, and even to the advance in the price of real estate. The city has widely outgrown its corporate limits, there is activity in building and improvements in all the pleasant suburbs, and, with the new pavements which are in progress, the city will be as attractive as it is prosperous.

Climate is much a matter of taste. The whole area of the alluvial land of the Mississippi has the three requisites for malaria—heat, moisture, and vegetable decomposition. The tendency to this is overcome, in a measure, as the land is thoroughly drained and cultivated. Memphis has a mild winter, long summer, and a considerable portion of the year when the temperature is just about right for enjoyment. In the table of temperature for 1887, I find that the mean was 61.9° , the mean of the highest by months was 84.9° , and the mean lowest was 37.4° . The coldest month was January, when the range of the thermometer was from 72.2° to 4.3° , and the hottest was July, when the range was from 99° to 67.3° . There is a preponderance of fair sunny weather. The record for 1887 was : 157 days of clear, 132 fair, 65 cloudy, 91 days of frost. From this it appears that Memphis has a pretty agreeable climate for those who do not insist upon a good deal of 'bracing,' and it has a most genial and hospitable society."

WISCONSIN.—*Milwaukee*, 195,000 : Reports for July, 285 deaths, of which 90 were under five years of age. Annual

death-rate, 17.5 per 1000. From zymotic diseases there were 65 deaths, and from consumption, 30.

INFECTIOUS DISEASES ABROAD DURING THE SECOND QUARTER, 1888.

By returns at hand from abroad, the number of deaths reported from infectious diseases during the *three months* ending June, 30th was from :

Small-pox in Sheffield, 84 ; Prague, 167 ; Paris, 82 ; Havre, 64 ; Trieste, 26 ; Marseilles, 32 ; Vienna, 27 ; Rheims, 22 ; Nice, 3 ; Bristol, 10 ; Manchester, 6 ; Leeds, 4 ; Lyons, 18 ; St. Petersburg, 29 ; Warsaw, 62 ; Cracow, 1 ; Bucharest, 19 ; Nantes, 5 ; Pesth, 4 ; Cairo, 6 ; Presburg, 17 ; London, 1 ; Hull, 9 ; Amiens, 6 ; Venice, 1 ; Jamappes, 36 ; Quaregnon, 4 ; Jumet, 4 ; Mons, 3 ; Bruges, 2 ; Tournai, 2 ; Gilly, 2 ; Wasmes, 2 ; Hornu, 2 ; Fleurus, 2 ; Nivelles, 2 ; Anvers and Gaud, each 1.

Measles in London, 247 ; Liverpool, 7 ; Glasgow, 106 ; Birmingham, 22 ; Manchester, 7 ; Dublin, 18 ; Leeds, 4 ; Sheffield, 5 ; Edinburgh, 17 ; Bradford, 44 ; Belfast, 81 ; Bristol, 17 ; Hull, 3 ; Newcastle, 2 ; Amsterdam, 13 ; Rotterdam, 1 ; Paris, 191 ; Lyons, 33 ; Marseilles, 144 ; Hague, 2 ; Nantes, 6 ; Saint Étienne, 7 ; Havre, 9 ; Rouen, 12 ; Rheims, 121 ; Nancy, 22 ; Amiens, 26 ; Nice, 5 ; Berlin, 75 ; Hamburg, 269 ; Munich, 13 ; Dresden, 10 ; Leipzig, 4 ; Breslau, 1 ; Königsberg, 1 ; Cologne, 2 ; Hanover, 2 ; Magdeburg, 1 ; Bremen, 1 ; Frankfort, 1 ; Düsseldorf, 1 ; Stuttgart, 3 ; Strasburg, 102 ; Altona, 17 ; Barmen, 1 ; Mayence, 1 ; Lausanne, 3 ; Chaux-de-Fonds, 1 ; Vienna, 97 ; Pesth, 41 ; Prague, 162 ; Helsingfors, 4 ; Debreczin, 6 ; Presburg, 3 ; Copenhagen, 4 ; Stockholm, 16 ; Christiania, 5 ; Cracow, 51 ; St. Petersburg, 553 ; Odessa, 3 ; Warsaw, 6 ; Venice, 97 ; Bucharest, 12 ; Brussels, 34 ; Anvers, 14 ; Gand, 1 ; Liege, 1 ; Bruges, 33 ; Malines, 1 ; Verviers, 2 ; Tournay, 17 ; Alost, 1 ; Lockeren, 7 ; Ypres, 1 ; Wetteren, 1 ; Grammont, 7 ; Hornu, 2 ; Braine-le-Comte, 3.

Scarlet-fever in London, 235 ; Liverpool, 32 ; Glasgow, 36 ; Birmingham, 5 ; Manchester, 35 ; Dublin, 40 ; Leeds, 17 ; Sheffield, 20 ; Edinburgh, 5 ; Bradford, 5 ; Belfast, 9 ; Bristol, 14 ; Hull, 12 ; Newcastle, 2 ; Amsterdam, 2 ; Paris, 58 ;

Lyons, 10 ; Marseilles, 11 ; Nantes, 7 ; Saint Étienne, 5 ; Havre, 5 ; Rouen, 5 ; Rheims, 7 ; Nancy, 4 ; Amiens, 8 ; Besançon, 6 ; Berlin, 48 ; Hamburg, 28 ; Breslau, 8 ; Munich, 28 ; Dresden, 11 ; Leipzig, 12 ; Cologne, 2 ; Magdeburg, 7 ; Frankfort, 7 ; Koenigsberg, 3 ; Hanover, 2 ; Nuremberg, 10 ; Bremen, 3 ; Chemnitz, 5 ; Dantzic, 30 ; Stuttgart, 2 ; Strasburg, 13 ; Elberfeld, 2 ; Altona, 3 ; Barmen, 1 ; Mayence, 2 ; Bale, 12 ; Geneva, 3 ; Lausanne, 1 ; Chaux-de-Fonds, 5 ; Vienna, 65 ; Berne, 1 ; Zurich, 1 ; Pesth, 20 ; Prague, 31 ; Trieste, 4 ; Debreczin, 4 ; Cracow, 11 ; Presburg, 3 ; Copenhagen, 36 ; Stockholm, 36 ; Christiania, 15 ; Helsingfors, 2 ; St. Petersburg, 142 ; Odessa, 7 ; Warsaw, 40 ; Bucharest, 13 ; Jassy, 11 ; Brussels, 2 ; Anvers, 4 ; Bruges, 8 ; Tournay, 1 ; Alost, 1 ; Hasselt, 1 ; Braine-le-Compte, 4.

Fevers.—*Typhus and Typhoid* in London, 148 ; Liverpool, 29 ; Glasgow, 26 ; Birmingham, 19 ; Manchester, 23 ; Dublin, 40 ; Leeds, 11 ; Sheffield, 12 ; Edinburgh, 7 ; Bradford, 6 ; Belfast, 8 ; Bristol, 5 ; Hull, 10 ; Newcastle, 4 ; Amsterdam, 6 ; Rotterdam, 3 ; Paris, 151 ; Lyons, 13 ; Marseilles, 72 ; Nantes, 22 ; Saint Étienne, 6 ; Havre, 35 ; Rouen, 11 ; Rheims, 9 ; Nancy, 5 ; Amiens, 8 ; Nice, 13 ; Besançon, 4 ; Berlin, 35 ; Hamburg, 51 ; Breslau, 6 ; Munich, 10 ; Dresden, 2 ; Leipzig, 6 ; Cologne, 2 ; Magdeburg, 3 ; Frankfort, 3 ; Koenigsberg, 58 ; Hanover, 5 ; Düsseldorf, 2 ; Nuremberg, 5 ; Chemnitz, 84 ; Dantzic, 5 ; Stuttgart, 1 ; Strasburg, 3 ; Elberfeld, 3 ; Altona, 17 ; Barmen, 1 ; Aix-la-Chapelle, 2 ; Metz, 4 ; Geneva, 3 ; Berne, 1 ; Lausanne, 1 ; Zurich, 1 ; Chaux-de-Fonds, 5 ; Vienna, 27 ; Pesth, 19 ; Prague, 66 ; Trieste, 6 ; Debreczin, 5 ; Presburg, 4 ; Copenhagen, 8 ; Stockholm, 8 ; Christiania, 1 ; Helsingfors, 6 ; Warsaw, 31 ; St. Petersburg, 344 ; Cracow, 13 ; Odessa, 8 ; Venice, 8 ; Bucharest, 23 ; Jassy, 2 ; Brussels, 27 ; Anvers, 12 ; Gand, 10 ; Liege, 7 ; Bruges, 18 ; Malines, 2 ; Verviers, 3 ; Louvain, 2 ; Tournay, 4 ; Seraing, 1 ; Bergerhout, 2 ; Mons, 4 ; Jumet, 5 ; Alost, 5 ; Charleroi, 5 ; Lokeren, 3 ; Gilly, 3 ; Turnhout, 1 ; Ypres, 3 ; Marchiennes au Pont, 2 ; Wasmes, 1 ; Boom, 1 ; Eecloo, 1 ; Zele, 1 ; Tamise, 1 ; Grammont, 1 ; Iseghem, 1 ; Arlon, 5 ; Tongres, 1 ; Ninove, 1 ; Furnes, 1 ; Dixmude, 1 ; Forest, 2.

Diphtheria and Croup in London, 348 ; Liverpool, 17 ; Glasgow, 45 ; Birmingham, 12 ; Manchester, 11 ; Dublin, 18 ; Leeds, 7 ; Sheffield, 11 ; Edinburgh, 23 ; Bradford, 1 ; Belfast, 20 ; Bristol, 5 ; Hull, 5 ; Newcastle, 4 ; Amsterdam, 50 ; Rotterdam, 11 ; Hague, 5 ; Paris, 490 ; Lyons, 58 ; Marseilles, 129 ; Nantes, 15 ; Saint Étienne, 24 ; Havre, 7 ; Rouen, 16 ; Rheims, 32 ; Nancy, 7 ; Amiens, 8 ; Nice, 17 ; Berlin, 228 ; Hamburg, 127 ; Breslau, 79 ; Munich, 56 ; Dresden, 44 ; Leipzig, 35 ; Cologne, 16 ; Magdeburg, 29 ; Frankfort, 49 ; Königsberg, 20 ; Hanover, 20 ; Düsseldorf, 10 ; Nuremberg, 56 ; Bremen, 3 ; Chemnitz, 9 ; Dantzic, 14 ; Stuttgart, 3 ; Strasburg, 43 ; Elberfeld, 19 ; Altona, 21 ; Barmen, 15 ; Aix-la-Chapelle, 1 ; Mayence, 3 ; Metz, 4 ; Bale, 12 ; Geneva, 2 ; Berne, 5 ; Zurich, 2 ; Chaux-de-Fonds, 4 ; Vienna, 127 ; Pesth, 93 ; Prague, 62 ; Trieste, 21 ; Debreczin, 3 ; Presburg, 12 ; Copenhagen, 98 ; Stockholm, 28 ; Christiania, 91 ; Helsingfors, 4 ; St. Petersburg, 145 ; Cracow, 28 ; Odessa, 14 ; Warsaw, 70 ; Venice, 3 ; Bucharest, 17 ; Jassy, 8 ; Brussels, 52 ; Anvers, 18 ; Gand, 15 ; Liege, 6 ; Bruges, 29 ; Malines, 8 ; Verviers, 4 ; Tournay, 30 ; Seraing, 2 ; Bergerhout, 3 ; Mons, 3 ; Alost, 10 ; Roulers, 14 ; Gilly, 1 ; Turnhout, 15 ; Marchiennes au Pont, 1 ; Hasselt, 8 ; Boom, 10 ; Wasmes, 1 ; Uccle, 3 ; Zele, 1 ; Hamme, 3 ; Eecloo, 1 ; Tamise, 1 ; Wetteren, 7 ; Grammont, 11 ; Vilvorde, 1 ; Iseghehem, 7 ; Termonde, 1 ; Boussu, 4 ; Binche, 1 ; Arlon, 9 ; Tongres, 1 ; Braine-le-Comte, 1 ; Hornu, 1 ; Poruwelz, 1 ; Wavre, 4 ; Koekelberg, 1 ; Morlanwelz, 1 ; Fleurus, 1 ; Blankenberghe, 1 ; Ypres, 2 ; Montignysambre, 1.

Whooping cough in London, 800 ; Liverpool, 101 ; Glasgow, 127 ; Birmingham, 52 ; Manchester, 128 ; Dublin, 84 ; Leeds, 62 ; Sheffield, 52 ; Edinburgh, 18 ; Bradford, 3 ; Belfast, 26 ; Bristol, 6 ; Hull, 17 ; Newcastle, 24 ; Amsterdam, 62 ; Rotterdam, 17 ; Hague, 15 ; Paris, 65 ; Lyons, 18 ; Marseilles, 26 ; Nantes, 2 ; Saint Étienne, 8 ; Berne, 1 ; Zurich, 2 ; Chaux-de-Fonds, 4 ; Rheims, 1 ; Amiens, 3 ; Hamburg, 26 ; Breslau, 6 ; Munich, 28 ; Cologne, 10 ; Vienna, 31 ; Bale, 5 ; Pesth, 8 ; Prague, 25 ; Trieste, 14 ; Debreczin, 5 ; Presburg, 4 ; Copenhagen, 29 ; Stockholm, 46 ; Christiania, 6 ; Helsingfors, 2 ; St. Petersburg, 41 ; Warsaw, 9 ; Odessa, 8 ; Bucharest, 23 ; Brussels, 13 ; Anvers, 9 ; Gand, 7 ; Liege,

4 ; Bruges, 16 ; Eecloo, 1 ; Tournay, 13 ; Seraing, 1 ; Jumet, 1 ; Alost, 2 ; Roulers, 1 ; Lokeren, 1 ; Uccle, 1 ; Jemappes, 1 ; Vilvorde, 3 ; Binche, 1 ; Maldeghem, 12 ; Braine-le-Comte, 2 ; Hornu, 2.

Incomplete returns during the same period show the continued presence of small-pox, diphtheria and croup, scarlet-fever and typhoid-fever in Rome ; and the special prevalence of these and other infectious diseases in Madrid, Milan, Genoa, Turin, and Lisbon.

MEXICO, 300,000 : Deaths during the two weeks ending June 24th, 541. The prevailing diseases were typhoid-fever, small-pox, enterocolitis, and pulmonary diseases.

LIMA, Peru, 100,000 : Deaths during the third quarter, 1887, 803—134 infants under six months ; from six months to twelve years, 130 ; 78 were caused by zymotic diseases, and 226 by *tubercular diseases*. "The mortality from pulmonary tuberculosis," says *La Cronica Medica*, "has increased to an alarming degree since 1884, so that in the quarter of 1887 it has been 25.77 per cent of the entire mortality. This steady increase is the result of causes which have weighed heavily on the whole population for some time past, as well as of a disregard for the teaching of science relating to contagious diseases, among which pulmonary tuberculosis is now classed."

CARACAS, 55,638 : Deaths during the first quarter, 1888, 459 ; of children, 192, 41 per cent of total. During the month of April the number of deaths was 144. *La Union Medica* says : "The sanitary condition of Caracas is, on the whole, satisfactory"—with a death-rate of 31.31 ?

BRUSSELLES, 177,568 : Twenty-sixth Annual Report of the Department of Health, Dr. Janssens, President, for the year 1887 :

Births, 5192—3743 legitimate, 1449, or 27.9 per cent, illegitimate. Of the 1449 illegitimate births, 180 were of mothers who were non-residents. Of the whole number of births, 59 were of wealthy parents, 322 of those in easy circumstances, and 4811 of the poor or indigent. Birth-rate, 29.2. Mar-

riages, 1815—525 non-residents; 33 were of the rich, 245 in easy circumstances, and 1537 among the poor and indigent. Marriage-rate, 20.4. Divorces, 55, 3.01 per cent of the marriages. Deaths (exclusive of 336 still-born), 3868. Death-rate, 21.08; 13 per cent of the deaths were caused by phthisis pulmonalis; 16.6 per cent from bronchitis and pneumonia.

ITALY.—Population and death-rates in Italian cities during the second quarter, 1888: Alba, 12,456, 20.8; Bologna, 90,000, 27.5; Brescia, 57,962, 30.3; Camerino, 11,941, 19.7; Cremona, 34,669, 26.4; Fermo, 18,719, 22; Frosinone, 10,422, 20.9; Firenze, —, 25.3; Genoa, 183,591, 32.9—from small-pox, 106; measles, 26; typhoid-fever, 20; Iglesias, 12,334, 25.9; Livorno, —, 27; Matera, 16,247, 72.5; Mazaro del Vallo (Trapani), 14,080, 34.5; Mirandola, 13,541, 22.8; Milan, 372,352, 36.4; Novi, 14,481, 21.2; Perugia, 52,498, 21; Pinerola, 17,333, 22.7; Potenza, 20,903, 18.9; Rome, 382,973, 30.6; Saluzzo, 15,863, 28.1; Sassari, 37,358, 20.6; Spoleto, —, 31; Torino, —, 34.1; Tortona, 15,234, 22; Treviso, —, 19.2; Varese, 14,618, 23.5; Vicenza, 38,993, 27.7; Viterbo, 20,040, 23.8; Voghera, 15,370, 36.1; Volterra, 14,352, 19.2; Venice, 150,502, 22.6.—*La Salute Publica*.

RUSSIA, generally, according to Dr. Bonbrow, has an exceedingly high death-rate—from 60 to 80 per 1000 of population in some centres, and 50 to 80 per cent of the deaths are of children.—*La Salute Publica*.

DEATHS FROM HYDROPHOBIA AFTER TREATMENT BY PASTEUR.—On May 16th last the young man Poulet, twenty years of age, who was bitten by a mad dog on December 6th, 1887, and treated at the *Institut Pasteur* from December 8th to January 6th, 1888, died of hydrophobia at the Hôtel Dieu, Paris. The treatment lasted about one month, and the period of incubation from the time he was bitten until his death, five months and ten days.

On February 1st last a child six and a half years old was bitten by a dog which did not seem to be mad. The surgeon on this statement merely closed the wound in the lip with a suture, but on April 3d the child showed signs of hydrophobia

and was taken to the *Institut Pasteur*, where it died on April 5th, with all the symptoms of hydrophobia. In this case the period of incubation was fifty-three days.—*Gazette Hebdomadaire des Sciences Médicales de Bordeaux*.

LITERARY NOTICES.

THE MEDICAL AND SURGICAL REPORTER, so long and so favorably known, has very properly called the attention of the editorial fraternity to a new journal which has assumed the *Reporter's* name, and this new journal, significantly of its purpose to filch the fruits as well as the name of our worthy contemporary, thus sneakishly calls itself "THE TOLEDO MEDICAL AND SURGICAL REPORTER," the first two words printed small, and the part of the title which copies the genuine article in large letters.

Surely nothing could better signify the exceeding smallness of the perpetrators of this attempted fraud than this effort to disguise it—*animus furandi*.

PTOMAINES AND LEUCOMAINES; OR, THE PUTREFACTIVE AND PHYSIOLOGICAL ALKALOIDS. By VICTOR C. VAUGHAN, Ph.D., M.D., Professor of Hygiene and Physiological Chemistry in the University of Michigan, and Director of the Hygienic Laboratory; and FREDERICK G. NOVY, M.S., Instructor in Hygiene and Physiological Chemistry in the University of Michigan. 12mo, pp. 322. Price, \$1.75. Philadelphia: Lea Brothers & Co.

This is a timely work on a subject of much importance, to which the authors, particularly Professor Vaughan, are well-known contributors and accepted authorities, though of but recent development. The knowledge of ptomaines and leucomaines is the outcome, or, rather, elaboration of the study of disease germs and *how* they cause disease. Putrid animal food has long been known to be more or less poisonous, but it is only since putrefaction has been known to be due to the action of bacteria, and that all ptomaines result from the growth of these bacteria, that ptomaines have become a subject of

importance. Like the germs upon which their production depends, they greatly differ in their properties, which conditions and differences this work describes. Leucomaines are "those basic substances which are formed in animal tissues during normal life, in contradistinction to the ptomaines or basic products of putrefaction," but, like their congeners, dangerous or otherwise according to such circumstances and conditions as are clearly defined and described in the work before us. It is only by a knowledge of these that physicians can have a correct knowledge of the danger of retained secretions elaborated by physiological action.

This work is the gist of all the literature on the subjects of which it treats hitherto published—thoroughly gleaned and in such wise presented as to be of the greatest practical utility to the medical practitioner.

ESSENTIALS OF CHEMISTRY AND TOXICOLOGY, for the Use of Students in Medicine. By R. A. WITTHAUS, A.M., M.D., Professor of Chemistry and Physics in the University of New York; in the University of Buffalo; in the University of Vermont; Member of the Chemical Society of Paris and Berlin; Member of the American Chemical Society; Fellow of the American Academy of Medicine, etc. Second edition. 16mo, pp. 294. New York: William Wood & Co. This is practically a new work, many portions having been rewritten and rearranged in consequence of the introduction of much new matter; and physics excluded, as, according to the opinion of the author, the application of the science of physics to medicine is so distinct from chemistry as to warrant separate treatment. The purpose of the publication, the author states, is not to produce a "cram compend," but to offer to students and teachers of chemistry in medical colleges an aid to *systematic* quizzing, as an adjunct to a regular course of lectures upon the subject.

NECESSITY FOR TEACHING HYGIENE IN SCHOOLS, by W. C. COOK, M.D., Health Officer, Nashville, Tenn., a paper read before and endorsed by the Section on State Medicine and Public Hygiene of the Ninth International Medical Congress, Washington, 1887.

MEDICAL EXCERPT.

CONSUMPTION IS ONE OF THE DEADLY PENALTIES OF TIGHT-LACING.—“The unnatural and most injurious habit of contracting the waist and chest by stays in a vice-like grip interferes with the functions of all the abdominal, pelvic, and thoracic organs. The circulation and proper function of the liver and spleen are greatly interfered with, digestion and chyli-fication are impaired, the pelvic organs are depressed below their normal level, the diaphragm is prevented from proper play, and the ribs cannot expand the chest walls; and the inevitable consequence is deficient respiration and aeration of the blood,” and *consumption*. “Under 5 years of age the census of 1870 and 1880 show more deaths of males than females from this disease. They also show a gradual increase of females after that age to 10 years, and after that to 15 the increase is quite rapid, so that at the latter age the census of 1870 gives deaths from males 501, and for females, 1056; and for 1880 the disproportion is still greater. Between the ages of 15 and 20 it is considerably more than double. This is the tribute females pay to fashion at that age. Females continue to hold the ascendancy till 35 years, in census of 1870, and to the 40th year in that of 1880, when the males again come to the front and lead the list the balance of life.”—*B. F. Hart, M.D., Brownsville, Mo., in St. Louis Courier of Medicine.*

ACTIVITY OF THE SCARLET-FEVER POISON AFTER A YEAR.—Dr. J. Brook Surgeon, U. S. Army, of Fort Monroe, Va., communicates the following case: “A girl aged about eight, living at this place, was some months ago attacked by scarlet-fever, the disease running a typical course. For a long time no possible source of contagion could be discovered. The child had not been absent from home, had been with no one lately exposed, and no other case was known to exist anywhere in the vicinity. Subsequently I learned that one of the house-servants had nursed a case of scarlet-fever in a distant city just about a year before. After the case terminated she packed some of her things, including some clothing then worn,

in a trunk, and left the place. A year later she had the trunk sent to her here, opened it, and took out the contents, the little girl being present and handling the things. Very soon after the latter was attacked, as stated.

“As fixing the period of incubation, it would be interesting to know precisely how many days passed from the time the trunk was opened until the disease appeared; but I was unable to determine that period satisfactorily.”—*The Medical Record*.

MEASLES.—Spraying or sponging the whole cutaneous surface with Listerine diluted, say one ounce to the pint of tepid water, will afford marked relief to the burning and itching so aggravating in this disease, and completely remove the characteristic odor.

THE ORIGIN OF DIPHTHERIA FROM BIRDS AND OTHER ANIMALS.—It has been known for some years that birds and poultry are subject to a disease which corresponds to what in the human being is known as diphtheria. Several foreign observers have gone a step further, and have endeavored to show that the disease is capable of transmission from animals to human beings. Last year Dr. Turner drew up an interesting report for the Local Government Board, bearing on this alleged transmissibility, and he adduced a large number of observations which seemed to indicate a connection between a diphtheritic affection, not only in fowls, but in rabbits and cats, and a similar affection in man. The report comprised several instances in which the “strangles” in horses appeared to give rise to a like train of symptoms. In a thesis by Dr. Menzie, the transmission of the disease from animals to man is attributed to the dejections of the former. Diphtheritic affections among fowls are very common in Italy, and he quotes an instance in which four out of the five children of a medical man were attacked and died. In this case he incriminates the thatched roof, which was inhabited by colonies of fowls, geese, pigeons, etc. The dejections of these animals, washed off by the rain, found their way into the cistern or well from which the supply of drinking-water was drawn.—*Medical Press and Circular*.

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NUMBER 227.

RECENT ADVANCES IN STATE MEDICINE.

THE ANNUAL ADDRESS BY THE CHAIRMAN OF THE SECTION ON STATE MEDICINE, DELIVERED AT THE THIRTY-NINTH ANNUAL MEETING OF THE AMERICAN MEDICAL ASSOCIATION, MAY, 1888.

By HENRY B. BAKER, M.D., Secretary, State Board of Health, Lansing, Mich.

THE By-laws of this Association require that "The Chairman of each Section shall prepare an address on the recent advancement in the Branches belonging to his Section." Thus the subject of this address is fixed; yet, most of us are too busily occupied with professional or official duties to study carefully all of such work reported in all parts of the world, especially as the field in State Medicine is so very extensive, depending upon, and utilizing, as it does, the progress in most of the medical and allied sciences. One must have a very broad view, much leisure, a good knowledge of several languages, and be familiar with the requirements of practical sanitary work, in order to summarize fully the "recent advancement in the Branches belonging to" this Section. I cannot hope to accomplish so much, and, if I could, you could not listen to it in forty minutes, but I shall do the best I can in the time at my disposal to place before the Section a summary of those recent advances in State Medicine which have attracted my attention and have impressed me as useful for our encouragement, for the suggestion of errors or obstructions to be avoided, or of new methods or combinations of facts useful for our progress.

GENERAL PRINCIPLES UNDERLYING USEFULNESS OF STATE MEDICINE.

Sanitarians are not so much nuisance abaters as formerly were the hygienists; and they are more disease-preventers. In the public-health service generally, methods are coming to be more instructive and less dogmatic and mandatory. Such opposition as that of Herbert Spencer, to boards of health constituted according to the old ideal, does not at all apply to State Boards of Health constituted on the modern plan, which makes their chief functions the collection, collation, and dissemination of facts which teach the causation of disease, the best means for avoiding and preventing sickness and deaths, and which facts are from sources so extensive as to be entirely beyond the reach of individuals, but which the people as a whole, through their governmental representatives, can easily collect, collate, and place before all classes of people, to be utilized by such as are sufficiently intelligent.

Modern methods of sanitation are thus in harmony with the law of "the survival of the fittest," if we consider, as I do, that the most intelligent classes, who obey the teachings of sanitary science, are best fitted to survive.

Any narrow selfishness, however, which might be engendered in one of this most intelligent class, by dwelling upon the idea that "I am holier than thou," is soon dispelled when he comes to see that no man lives entirely to himself alone; not only is each person to some extent his brother's keeper, but he is dependent on all about him for immunity from dangerous communicable disease, and for safety of life and health in various ways.

The highest selfish interests thus join with the highest benevolence in favor of the widest possible diffusion of sanitary knowledge, and of the most complete obedience to sanitary precepts, ordinances, and laws.

INCREASE OF THE PUBLIC HEALTH SERVICE, AND OF SANITARY PUBLICATIONS.

An important factor* in sanitary progress is the increase in the number of persons who enter, more or less permanently, upon some branch of sanitary work. In many of our States such increase is very great. For instance, in Michigan when

the State Board of Health was organized, in 1873, there was hardly an active local board of health in the State ; very few local health officers were appointed ; while for the year 1887-88 over thirteen hundred local health officers were appointed in the State, and many of them physicians who devote considerable time to the work.

The increase in the numbers of our people who live in the cities and villages, the improvements in plumbing and other sanitary appliances, the increasing tendency toward sanitary inspections of such appliances, with the increased number of health officers and sanitary officials, and the greatly increased public interest in sanitary affairs, has built up a class of sanitary and trade journals, which do much for sanitary progress. Many physicians are now or have been health officers. For this, and other reasons, the medical journals seem to contain an increasing proportion of literature bearing upon sanitary administration, and other branches of State Medicine.

But the most important factor tending to increase the demand for sanitary literature is the work of the boards of health themselves, and especially that part of their work which consists in spreading among the people, in popular pamphlet form, the existing knowledge applicable to the restriction and prevention of the most dangerous diseases, including the relations of low ground-water and of contaminated water to typhoid-fever, and similar information of immediate practical utility. This work is productive of immediate good in the reduction of the sickness and mortality from such dangerous diseases ; and it stimulates a general desire among the people for more knowledge on such vital subjects.

The apparent popular demand for sanitary literature is being met by several of the State Boards of Health, by the publication of a monthly journal which serves as the organ of the State Board which issues it, and as a convenient means of regular communication between the office of the Board and the health officers and others throughout the State who are interested in public health work. Such a journal is now published in Minnesota, Maine, Pennsylvania, Tennessee, Ohio, Iowa, and perhaps other States. In some of the States the proceedings of the State Board are published quarterly, and distributed quite generally within the State.

ORGANIZATION.

The increased number of persons in the public health service, with the growing general interest in their work, prompts organization for comparison of methods of work, for co-operation wherever practicable, and for the general promotion of sanitary affairs.

In some of the States this tendency has led to the formation of Sanitary Associations, consisting mostly of physicians and others of the leading thinking classes. The Ohio State Sanitary Association is a notable example; but Associations have been formed in other States. The principle involved is not quite the same as in the "Associations of Medical Officers of Health," in England and in the Province of Ontario; but inclines more toward the popularization of sanitary information and measures among the people generally than toward the advancement of the knowledge of the medical officers of health. The assumption (which is probably correct) seems to be that the medical officers of health are now in advance of the people, and do not, so much as the people generally, need to advance their knowledge of sanitary science or of sanitary administration. However, under the system of free and general distribution of the best that is known by State Boards of Health, it would seem that the time is near when, throughout this country, Associations of medical officers of health need to be formed, for their own advancement, and for the best interests of sanitary progress.

In Michigan and some other States, although local Sanitary Associations have been formed, sanitary conventions have, thus far, been the principal method of popularizing sanitary measures. The topics chosen have reference to the greatest apparent needs of the locality in which the convention is held, such, for instance, as the present methods of disposing of excreta and waste products, and the present source and condition of the water-supply of the city or village, including the exact relations of privy-vaults to wells in the principal business part, and the principal residence portion of the place, and the explanation of the best means for restricting the most dangerous communicable diseases.

These practical questions of vital importance can be so presented by members of State Boards of Health, by leading

physicians, lawyers, and ministers, and so impressed upon the people of almost any community that thereafter much greater attention will be given to affairs which relate to the public health.

THE NATIONAL CONFERENCE OF STATE BOARDS OF HEALTH.

The increasing intelligence of the people is now tending to stimulate progress by those who aim to lead the people in State Medicine. The most notable organization of this nature within recent years is the Conference of State Boards of Health, a National Association of delegates from State Boards, but having international tendencies, as shown by the fact that it includes delegates from the Provinces of Canada. It has had its fifth annual meeting in Cincinnati, just preceding this meeting of the American Medical Association. It does not supplant the older American Public Health Association, which aims at the popularization of sanitation, and for the advancement of sanitary science, but its work differs from both these functions of the older Association, being largely concerned with the practical questions of official public health work, and its membership is restricted to officers who represent those who can put in force the conclusions reached by the conference. It is a league which, to some extent, serves to unify the Public Health Service of the United States, and might be utilized in the same direction to a much greater extent by the United States Government, to supply the lamentable loss of our National Board of Health, or to co-operate with a National Bureau of Health or with a National Board of Health, should the present Board, or a new one, be granted an appropriation.

LEGISLATION : LOCAL, STATE, NATIONAL.

Sanitary laws are commonly supposed to have two functions : if properly published and enforced, they are educational ; and they may be enforced in cases where no other course will secure obedience to sanitary precepts. But sanitary laws have other functions. A new general principle of sanitation, before suggested, is important, especially in connection with sanitary legislation. According to this general principle of action it would seem that, for the interests of sani-

tary progress, the most important legislation is that which provides for the collection of facts, not only those upon which to base immediate action, but also those out of which to construct sanitary science ; that which provides also for the comparison and study of those facts by persons especially qualified for that service, and for the publication of the results of such statistical and other researches for the benefit of all classes of people. The facts necessary for immediate action are as imperatively needed as is the knowledge of the location of a burning building, and for much the same reason—in order that the danger may at once be averted. And, as in the case of a dangerous communicable disease, life and health as well as property are at risk, any ordinary pecuniary interest of the individual should yield to the high moral duty to the public safety, and await recompense from the public. Therefore I agree with Dr. Rohé, our chairman last year, who said : “ The *first* requirement, then, in dealing with infectious diseases, from a ‘ State Medicine point of view,’ is *notification* ; and inasmuch as such notification will never be effected if voluntary, it must be made compulsory.

“ The *second* requirement in restricting the prevalence of such diseases is the segregation of patients, and guarding healthy individuals, except the immediate attendants, from contact with them.

“ The *third* requirement is prompt and thorough disinfection—in other words, the absolute destruction of the infective properties of infectious matter, in whatever that may consist.

“ I would therefore declare the watchwords of the practical and progressive sanitarian, in dealing with communicable diseases, to be these three : *Notification, Isolation, Disinfection.*”

There seems to be progress in the first essential (notification) in many parts of the country. In England the area of country coming under that law is increasing, and it is proposed by the local government board to extend the system of compulsory notification, and perhaps to make the law general, although in that country there has been opposition by some of the medical profession. In Michigan notification of dangerous diseases is compulsory upon householders and physicians, and physicians are allowed a very small fee (ten cents) for each case reported. Only small-pox, diphtheria, and scarlet-

fever are specifically mentioned in the law, but several other diseases, including typhoid-fever and r  theln, have been declared to be "diseases dangerous to the public health." Increasing attention to this subject is noticeable in Michigan, in Wisconsin, in Minnesota, in Maine, in Iowa, in Indiana, in Kentucky. In New Hampshire, also, a law has been enacted requiring physicians to report all cases of diphtheria and scarlet-fever to the local board of health.

STATE LEGISLATION: PROTECTING THE PURITY OF INLAND WATERS.

The last general court of Massachusetts made an appropriation of \$30,000 for the use of the State Board of Health in protecting the "purity of inland waters." "It was thought wise to begin with the largest and most important supplies." . . . "From time to time other water supplies have been examined in this exhaustive manner." . . . "Four rivers in the State have been systematically examined." The results of these examinations are given in the report of that State Board, made January, 1888. The Board has established an experiment station, to determine the amount of sewage that can, in that climate, be purified by application to different soils.

LEGISLATION: NATIONAL.

That the United States Government pays less attention to those highest earthly interests of its citizens—human health, and life itself—than other governments, and even less attention than it gives to the protection of the swine and other domestic animals, is a cause for regret and shame to all intelligent citizens, and especially to physicians, because their attention is so frequently called to the subject, and because they realize how much might be done for the prevention of epidemics, and, more especially, of the sickness and deaths from the most common causes.

As usual, there is now before Congress a bill for a National Health Service.

WHAT PREVENTS NATIONAL LEGISLATION IN THE INTERESTS OF PUBLIC HEALTH.

A brief review of some of the efforts of physicians and Associations may aid to a clearer understanding of the situation.

Fifteen years ago in this same city of Cincinnati, May 1st, 1873, I listened to a report to the American Public Health Association made by C. C. Cox, M.D., LL.D., of Washington, on "The Necessity for a National Sanitary Bureau." The report, and the "Bill to Establish a Bureau of Sanitary Science," which had already been presented to the United States Senate, are published in Vol. I., pp. 522-32, of the Transactions of that Association.

Dr. Cox said: "Regarding the continually increasing sanitary wants of our country, . . . it occurred to me that our Government should advance among the first to conserve the health of its population, and avert the disasters which menace it. With this view I prepared, in 1871, the plan of a National Bureau of Health. This was subsequently submitted, as you are aware, at a meeting of the sanitarians, representing the different sections of the country, assembled at New York, and endorsed by them in a series of commendatory resolutions."

After the reading of the report by Dr. Cox, the American Public Health Association adopted a resolution "that, in the judgment of this Association, the establishment of a National Sanitary Bureau, with relations to the general government similar to those of the Bureaus of Agriculture and Education, is highly desirable as a means of promoting sanitary science and the protection of the public health."

November 14th, 1873, at the meeting of the American Public Health Association in New York, resolutions presented by myself were adopted, favoring the project, and for the appointment of a committee representing, so far as practicable, each State in the Union, to memorialize Congress, and to co-operate with a similar committee or "section" of the American Medical Association. Through the belief of the President of the Health Association and others that the time was not favorable, the effort was not vigorous, and it was unsuccessful at that time.

November, 1878, at a meeting of the American Public Health Association in Richmond, Va., I again presented resolutions outlining proposed duties of a permanent United States Health Commission, proposing a committee of the Association to memorialize Congress for the establishment of the Commission, and for the appointment of a standing committee on

Public Health in each legislative branch of the United States Government. The yellow-fever epidemic of that year emphasized the need for some action by our Government. The Association committee was appointed, nearly every State being represented upon it. Dr. Billings, of Washington, was especially active. Hon. J. H. McGowan, a member of Congress from Michigan, was induced to confer with Dr. Billings, introduce a bill, and labor for its passage. The National Board of Health was thus established. For a few years it did excellent work, which was commended by the leading sanitary associations in this country. It had the respect and confidence of nearly every sanitary authority in this country; but, from the first, it had the determined opposition of a few who were in office and power in Washington, and who were eventually able to cripple and finally to defeat appropriations for it by Congress. The distinguished sanitarians who were its first members dropped out, and to-day the Board exists only in name.

In a recent number of the *New York Medical Journal* is an editorial entitled "The Marine Hospital Service and the Proposed National Bureau of Health," in which is an account of the arguments recently before a committee of Congress for and against the proposed legislation. The arguments for it were mainly by the President of the National Conference of State Boards of Health, and by three ex-presidents of the American Public Health Association, a committee representing the principal sanitarians and sanitary organizations of this country. The only opponent mentioned was Dr. Hamilton, of the Marine Hospital Service, who "submitted a brief." The editorial says: "Under one form or another, the old National Board of Health has been sought to be revived on several occasions, and each time Dr. Hamilton has had to oppose the attempt almost single-handed."

Officers in the medical departments of the army and navy, on the other hand, have favored the National Board of Health or other public health legislation; but it is much easier to prevent than to obtain appropriations.

FOR WHAT PURPOSE ARE WE HERE?

In order to fulfil the duties assigned to me, I have studied again the apparent intention of the founders of this section,

and of those who have contributed to its maintenance. It would seem that there has been and is in the medical profession a profound desire to promote the general welfare by utilizing for the public good those vast stores of scientific and practical information gained by the medical profession, which, although not of much use in the *treatment* of disease, are capable of a much more important service in the *prevention* of disease. I think there is a growing belief that there is a higher plane than even the exalted one on which the medical practitioner has long stood, and that if quite a large proportion of the medical profession were employed and paid for their efforts for the prevention of disease, their relations to the people would be of the noblest kind. The methods which tend in this direction are those which seem to have actuated the founders of this Section—those which favor the formation of State and other Boards of Health, and (as the name of the Section, “State Medicine,” implies) build up the legal organizations, local, State, and national, through which only can the public reap the results of the progress in sanitary science.

But those of us who have watched the progress of this Section know that although the Section has almost uniformly held back from recommending specific legislation, sometimes even discouraged attempts at public health legislation, it has always favored that other essential to progress in this direction, the building up of a sound sanitary science for the use of the State, whenever the State shall become sufficiently intelligent to utilize it.

Nearly all the papers and discussions before this Section are expected to contribute to this scientific branch of our work; therefore, if numerous important lines of work in the sanitary sciences, during the past year, are not mentioned in this address, they are likely to be brought out during this meeting, especially those relating to the topics especially chosen, “Malaria and the Causation of Fevers.” There has been considerable progress in the knowledge of the causation of fevers, but a satisfactory mention of the lines of work would take too much of the time allotted to this address.

DEVELOPMENT OF THE GERM THEORY OF DISEASE.

Progress seems to be in waves, and greatest along certain lines. Recently many have been engaged in investigation and

experiment in developing the germ theory of disease. Great progress has been made, considering that it has been largely the contributions of individuals ; for, as a rule, those for whom this work is most valuable—the common people themselves—have not yet awakened to the importance of such work so as to demand of their representatives that it shall be maintained by the governments. The Imperial Government of Germany has wisely maintained the laboratory in which Dr. Koch's great contributions to science have been taught to large numbers from many countries. In this country the General Government has done little worthy of special notice, but individual officers, in several branches of the United States Service, have contributed much toward progress in this direction, notably Dr. Sternberg, of the Army Medical Department.

A writer in *Science* has lately published results of an inquiry by circular, addressed to each of the medical schools in this country, asking questions concerning the germ theory, and what is being done about it. Replies were received from those colleges in which the greatest number of students is taught. He concludes that quite a number of bacteriological laboratories have been established in connection with our larger medical schools. They are under the charge of competent directors, and are places where original research is being carried on, and where students have an opportunity to familiarize themselves with the subject in a practical manner. American medical schools are thus doing their share in this research in this manner, and the endeavor to advance our knowledge of bacteria and their relation to disease.

In Baltimore there is a well-equipped bacteriological laboratory under the direction of the Professor of Pathology of the Johns Hopkins University. In Brooklyn, the Hoagland Laboratory—the gift of Dr. C. N. Hoagland—under the immediate supervision of that gentleman, who provided the funds for the building and its equipment, “will supply all the facilities, both for students and for advanced investigators, which can be found in the best-equipped laboratories of Europe.”

In Missouri the Legislature has appropriated \$5000 for “the creation of laboratories for bacteriological study and investigation, and for the culture of vaccine virus, in connection with the State University at Columbia.”

A STATE LABORATORY OF HYGIENE.

In Michigan the Legislature has appropriated \$35,000 for the building and equipment, at the State University, of two laboratories, under one roof, one being a laboratory of hygiene. The building will be ready for occupancy next October. Dr. V. C. Vaughan, Member of the State Board of Health, and Professor of Hygiene in the University, is Director of the laboratory.

Professor Vaughan's first Quarterly Report of work (the chemical laboratory being temporarily used) has been published by the Michigan State Board of Health, and includes a history of important contributions to sanitary science. He has isolated the Eberth bacillus of typhoid from water believed to have caused that disease; he has caused a disease resembling typhoid by injecting these bacilli into an animal, and has caused a rise of body temperature in animals by injecting a ptomaine, formed by those bacilli, but sterilized before its use. Dr. Vaughan has been able to find these bacilli in the air of a house-drain into which discharged a soil-pipe carrying discharges from a typhoid patient. He has made cultures of the bacilli there found. Other cases of typhoid-fever had apparently been caused by the inhalation of air contaminated by emanations from that same house-drain.

A SPECIFIC CAUSE OF TYPHOID-FEVER.

That filth alone will not cause typhoid-fever, in the absence of the specific cause, is constantly becoming more evident. A notable instance is given by Dr. F. H. Blaxall, R.N., in the *London Practitioner*. An outbreak of typhoid-fever occurred among persons using water from a spring which, although known to be badly contaminated by excreta, had been used without causing typhoid-fever for a period of fifteen years; yet soon after the arrival of cases of typhoid-fever in the vicinity of the spring, thirty-six families were invaded, with some eighty cases of recognized typhoid-fever, eight proving fatal. All the persons attacked had drunk of the water from the spring. In this instance, the disease was not communicated from person to person, nor to persons who used the same water-closets as did those who had the fever. This evidence is especially of importance as to the protection

of the water supply from typhoid excreta, and of the disinfection of all excreta from typhoid patients.

BACTERIA AND SUMMER DIARRHŒA.

Results of experiments and bacteriological observations in summer diarrhœa have been published. Many bacilli were studied, but one chief bacillus which was found somewhat resembled that of Asiatic cholera, but is shorter and thicker. Cultivation of bacilli from air from sewer ventilators showed some which resembled those found in the organs of persons dead from diarrhœa, but they were much slower in their growth. Those from the intestines developed rapidly, liquefied jelly became alkaline, and bacilli of the fifth generation emitted a powerful odor of decomposition. A very small dose of the artificially cultivated microbes produced a smart attack of diarrhœa.

ALBUMINURIA FROM SEWAGE POISONING.

Dr. George Johnson, in the *British Medical Journal*, March 13th, 1888, "directs attention to the fact that among the many causes of blood contamination and consequent albuminuria, sewage poisoning is by no means an infrequent one."

BACTERIA IN CEREBRO-SPINAL MENINGITIS.

Fränkel, Weichselbaum and others, in a series of cases of primary cerebro-spinal meningitis, have obtained pure cultivations of Fränkel's pneumococcus which, I suppose, is the coccus first discovered by Dr. Sternberg, in his saliva (*Micrococcus Pasteuri*, Sternberg), and which is fatal to rabbits, and has been found in pneumonia more frequently than other micro-organisms. Weichselbaum has also described a new coccus in six cases of idiopathic cerebro-spinal meningitis. Dr. F. Goldschmidt has reported the same micro-organism in one case; and Dr. Biggs, of New York, in one case, found a diplococcus probably identical with the one described by the other two observers.

THE SPECIFIC CONTAGIUM OF SCARLET-FEVER.

That there is a specific contagium of scarlet-fever is not doubted now, I suppose, by any intelligent physician; but

just what that contagium is has not yet been satisfactorily proved. The results of Dr. Klein's investigations into the subject, in connection with the Hendon cow disease, supposed to be scarlet-fever in the cow, have been strongly combated.

Experiments by Dr. Edington, of Edinburgh (made at the suggestion of Dr. Jamieson), carried on with bacteria from the blood, organs, and skin in different stages of scarlet-fever, revealed one bacillus constantly present in the blood before the third day of the fever, and in the desquamating scales after the twenty-first day. This, he concludes, is the contagium of the disease.

DIPHTHERIA IN MAN AND ANIMALS.

Dr. Turner's report to the Local Government Board, in England, in 1887, collected what was known on the subject of diphtheria in animals. Instances were given of its spread in pigeons, in fowls, and afterward to families of persons, among swine, horses, cats infected from man and man from cats, successful inoculation of cats, and the occurrence of diphtheria among shepherds after the disease had prevailed among sheep. Bacteriological studies of diphtheria have led Loeffler to conclude that the bacillus is different in the calf and in the fowl, and still different in man. Such discrepancies remain for further investigation. Probably much knowledge, useful for the saving of human life, might soon be worked out if the people would maintain more workers in this field of investigation.

SUPPURATION ALWAYS DUE TO MICRO-ORGANISMS. A FUNCTION OF THE LEUCOCYTES.

Although migration of leucocytes occurs under a variety of conditions and circumstances, the general principle that suppuration is always due to the action of micro-organisms seems to be established.

A recent writer has said: "There seems to be but little doubt that there exists a constant relation (as regards several of the infectious diseases certainly) between the amount of suppuration and the degree of immunity that different animals show to the respective diseases. The greater the emigration of leucocytes the greater is the insusceptibility, and *vice versa*, the leucocytes apparently destroying, or counter-

acting the effects of, the micro-organism. Suppuration thus comes to be a conservative process, protecting the system from the action or entrance of the microbes. Perhaps this is always its function."

At any rate, knowledge of the relations of the white corpuscles of the blood to the specific micro-organisms of disease seems to be progressing.

PERIOD OF INCUBATION.

Some experiments by Professor Vaughan, of the Michigan State Board of Health, indicate that the length of the period of incubation of typhoid depends much upon the number of specific bacteria taken into the body, and whether or not a communicable disease shall be contracted may depend upon the quantity of the specific cause which gains entrance to the body.

DIAGNOSIS OF CHOLERA IN DOUBTFUL CASES.

Further evidence of the practicability of aiding the diagnosis of cholera in doubtful cases, by cultivations of the micro-organisms from the intestines or the excreta, has been supplied by Drs. S. T. Armstrong and J. J. Kinyoun, of the United States Marine Hospital Service, and Drs. H. Biggs and T. Mitchell Prudden, of New York.

CAN CHOLERA BACILLI REPRODUCE IN WATER OF NEW YORK BAY?

The salt water in New York Bay has been "Sterilized and inoculated with pure cultivation of the spirilla of Asiatic cholera and also of Finkler and Prior," by Dr. J. J. Kinyoun, of the United States Marine Hospital Service, with the result that "These spirilla have not only been kept alive, but have also greatly increased in numbers." The inference is published that "If dejecta from cholera patients should be thrown into the lower bay, cholera could gain a foothold on the contiguous shores, where every condition favorable to its development and propagation sometimes exist." The temperature at which the cultivation was maintained is not reported; neither is the temperature of the water at the shore in the most dangerous season; but if there is a probability that such

development can occur there, further experiments and observations of temperature will be awaited with great interest, because of the practical importance of the subject, for the safety of this country from cholera.

QUARANTINE.

There has apparently been great progress in keeping certain diseases out of this country by means which we yet call quarantine. Formerly yellow-fever was so frequently introduced into New Orleans that many believed it was endemic there; and cholera was generally brought into this country whenever it was prevalent in Europe. Now both of these diseases are kept out. The great money losses to trade in New Orleans have tended to aid sanitarians in perfecting the quarantine at that point. Under the able leadership of that brilliant sanitarian, Dr. Joseph Holt, the quarantine at New Orleans has been brought to a high state of perfection. Perhaps the best evidence of the possibility of general progress, however, is the general criticism of what has heretofore received no attention. As an offset to the criticism of the quarantine system at New York, it should be noted that during the last year that port of New York has been tried—cholera was brought to it, and, so far as is now known, it was not allowed to gain a lodgment. Aside from speaking well of a bridge that allows one to cross in safety, there are other considerations which should make us slow in trying to displace State or local quarantines; there are vast State and local interests in trade and travel which should join with the interests of public health in building up and improving local quarantine administration. Thus far the United States Congress has not exhibited such a steadfast purpose to guard the lives of the people as to inspire confidence in the United States Government as the best and only protector of the lives and health of the American citizens. Just now there seems to be those who urge that the National Government shall gain control of *all* quarantine. Without considering the constitutional objections, it seems to me that it will be much safer to hold fast to that which we have, at least until such time as the National Government shall demonstrate its ability to do as well. What is really needed is that the local quarantines shall be perfected; that the National Gov-

ernment shall *add* its best services to those of the States and localities ; and that those other dangerous communicable diseases, diphtheria, scarlet-fever, and typhoid-fever, which cause much more sickness and deaths than do yellow-fever and cholera, shall also be excluded by quarantine. If it be argued against this plan that those diseases are endemic, it may be replied that before its exclusion yellow-fever appeared to be endemic ; and small-pox is still, yet we try to exclude it, and undoubtedly save thousands of lives thereby, and might exclude it almost entirely by more perfect methods.

YELLOW-FEVER.

If, as reported, yellow-fever is now present in Florida, there is cause for alarm which should lead to extraordinary efforts to limit that dread disease, because it is early in the season. There is no State Board of Health in Florida, and the inspection of travel, isolation of infected persons, disinfection of all infected articles—those measures which constitute the new “quarantine”—are not easily enforced, and in inland places can be avoided by those familiar with the locality. Nevertheless, these measures are the most promising yet suggested.

SMALL-POX.

Since January 1st, 1888, small-pox has been reported in twenty-one States of this Union. Small-pox is now reported in nine States, as follows : Connecticut, California, Colorado, Illinois, Kentucky, New York, Minnesota, Pennsylvania, and Wisconsin. Although small-pox is still (or was recently) present in nine States, it is not spreading, and it speaks highly for the utility of the public health service generally throughout this country that although introduced into twenty-one States of the Union, small-pox has not been allowed to spread to any great extent, except in California, where its restriction, on account of the Chinese, was especially difficult.

CHOLERA SHOULD BE MADE A DISEASE OF THE PAST.

Dr. W. J. Simpson, Health Officer of Calcutta, has reviewed, in the *Indian Medical Gazette*, the evidence as to the influence of season, rainfall, and water-supply upon cholera, accepting the evidence brought out by Dr. Payne and elaborated

by Dr. O'Brien, that in Calcutta the cholera was greatly reduced by the improved water-supply, and the evidence collected by myself that it was greatly influenced by the rainfall, and he has added much to the completeness of these converging lines of evidence. Dr. Simpson says: "In the common condition of polluted wells and tanks, and the habits of the people, we have an explanation of seasonal cholera prevalence in Calcutta, synchronous with cholera prevalence in the neighborhood, while the increased scarcity of water in the town during the last five or six years, culminating in such expedients as underground tanks for collecting water which ought to reach at least the first floor of the houses, we have a fair explanation of the increased cholera prevalence of late years in Calcutta, out of proportion to the period between 1870 and 1880." Speaking of the effect of the rains, he says: "They purify the air, they wash the filth from the soil, they purify and give an abundant supply of water to the wells and tanks; but, in addition to these things, in the town they perform a most important function, they flush the drains." Dr. Simpson closes his forty pages with these words: "A study of the distribution, progress, and seasonal changes indicates that the chief factor is want of pure water."

Elsewhere I have suggested that "if the prevention of cholera in its home is so largely dependent upon the rainfall and upon a good water-supply, one direction is thus indicated for most successful efforts for its prevention in this country."

Here I wish to suggest that, inasmuch as all the cholera throughout the world is derived from the small endemic area around Calcutta, the nations of the earth might well undertake an international work for doing away with that "chief factor" of cholera prevalence in the endemic home of cholera—namely, that "want of pure water." Two thirds of the cholera mortality in Calcutta has once been stopped in that manner. The inference is plain that the other third might be stopped by more thorough but similar means; and if in Calcutta, then also in the area around Calcutta. The work would be difficult, partly because about Calcutta the ground-water is brackish; but I believe the scheme is entirely practicable. It would be a noble mission to accomplish this, and, as an international work, it would "pay" in dollars and cents.

PURIFICATION OF WATER BY CHEMICALS.

Progress has been made in our knowledge of methods of improving public water-supplies. The practice of adding a minute quantity of alum to water in order to clarify it is an old and very familiar one. Recently one method of applying it continuously to public water-supplies has been patented. Professor Albert R. Leeds, of Hoboken, N. J., added alum, in the proportion of half a grain to a gallon of water, and found, with the precipitation of peaty matter, etc., a reduction of the bacteria to such an extent that whereas before precipitation it contained 8100 colonies per cubic centimetre, after precipitation the supernatant water contained only eighty colonies. They were all the bacterium lineola, and by filtering this supernatant water through a double thickness of sterilized filter paper into a sterilized tube, he found no bacteria in the filtered water. An interesting question is, whether or not the bacteria of typhoid-fever would be removed by this same agent in a similar manner. Professor Leeds suggests the addition, also, in certain cases, of lime or soda, or a minute amount of soluble iron salt, like ferric chloride, and its removal, together with the bacteria, by filtration.

VITAL STATISTICS.

Vital statistics supply an important basis for public health work. We are dependent upon mortality statistics for our knowledge of what are the greatest dangers to life, and of what progress we are making in the prevention of deaths. Although the importance of vital statistics is well known to sanitarians, it is not yet appreciated by the people generally; and the practical work with statistics is so difficult that comparatively few master the general principles. There are no journals or ready means of comparison of views among statisticians; therefore progress is slow, especially in laws for the collection of vital statistics. Yet there is progress toward the collection and the improvement of some statistics in this country. In Minnesota, Dr. Hewitt, Secretary of the State Board of Health, has within the past year effected considerable in this direction. In the Connecticut State Board of Health Bulletin for February, 1888, Dr. Lindsley, Superintendent of Vital Statistics, says: "For the first time since these monthly bul-

letins have been issued, reports have been received at this office from every town in the State." The last quarterly report of the Illinois State Board of Health says: "For the first time since the collection of vital statistics was begun, all the counties have made returns of births and deaths."

SICKNESS STATISTICS.

For some purposes, including those of immediate action for the restriction of dangerous diseases, reports of sickness are much more valuable than the reports of deaths. An account of the methods successfully employed for several years in Michigan was given before this Section last year. Those methods are being continued in Michigan, and the State Board of Health of Ohio has established methods somewhat similar, which promise very useful results.

THE ETIOLOGY OF DISEASES.

Sickness statistics are especially valuable in studying the causation of diseases. The sickness is nearer than the deaths are to the time of the causation of the disease. The statistics of sickness and meteorology in Michigan have proved that most of the important diseases are controlled by conditions of the atmosphere. Even such diseases as small-pox and scarlet-fever, due to specific causes, have close relations to the coldness and dryness of the air inhaled. This knowledge does not antagonize the importance of isolation and disinfection in such diseases, but it shows why these measures are especially important when the air is cold and dry; and, inasmuch as the virus of those diseases clings for a long time to infected articles, it explains why, unless disinfection is enforced at all times, these diseases tend to break out and spread during the cold seasons of the year. The explanation is found in the fact that nearly every one of the diseases of the throat and air-passages is increased after the inhalation of cold dry air. Communicable diseases which enter by way of the air-passages thus find at such times a most easy entrance. Consumption is found to follow the same law, increasing after the cold dry season of the year, and decreasing after the warm moist season.

It appears, therefore, that there has been great progress in our knowledge of the relations of sickness to meteorological

conditions, so that, in Michigan at least, we are now able to say under what meteorological conditions each one of many of the most important diseases will increase or decrease in prevalence. The times, or at least the conditions of the rise and fall of the sickness from these diseases, can be predicted in advance with almost as much accuracy as can the recurrence of the seasons. This may seem to you like laying claim to one of the grandest of recent human achievements, but I think the statement is strictly true, and this knowledge of the conditions tending to the occurrence of diseases should aid us greatly in the adoption of measures for their prevention.—*Journal of the American Medical Association.*

DISPOSAL OF THE DEAD—RETROSPECT OF INTERMENT PRACTICES.

By EDWIN CHADWICK, ESQ., C.B.

AT the meeting of the Church of England Funeral Reform Association, at Grosvenor House, London, May 14th, 1888, Mr. Edwin Chadwick, who was invited to speak on the subject, said that the objects of the Association involved larger topics of sanitary reform than had yet been noticed. After he had concluded his report "On the Sanitary Condition of the Laboring Population," of 1842, which was accredited as laying the foundation of sanitary science, he was pressed to examine the subject of interment in towns, which proved a very severe task, but which he accomplished to the satisfaction of that great prelate, the Bishop of London, Blomfield, and also of Bishop Coplestone. In his (Mr. Chadwick's) report on the question, he set forth an extended plan of executive sanitary administration, by which in the single rooms occupied by families of the wage classes, the prolonged retention of the dead, until excessive funeral money could be provided, of the bodies among the living, and to their danger from diseases of the zymotic class, would be obviated, and immediate removals made in a respectful manner to mortuaries of a superior character, from thence to a superior place of interment, with more impressive services. Some advances had been made in provi-

sions for interment in Paris. The Commissioners went there and examined them. The French executive authorities declared that the plan provided for the British metropolis was far superior to their own, and expressed the hope that it would be carried out as a great example. But the party-political chiefs then, as now, went in for what is properly called vestralization; the provisions made were partial and vulgarized; the few mortuaries that have been erected are of an inferior character, so also are the places of interment. These places are reported to be in a very bad condition from neglect of the sanitary principles provided for application for the protection of the living. Of matters disclosed by the original examination were the excessive allowances for the funerals for children, and these were shown to operate as bounties for infanticide; and these bounties, though they might be reduced, still continued in their malefeasant operation. Besides these, it appeared that secret murders were proved to be far more common than the public had any conception of. In examining undertakers as to the sanitary effects of the immediate removal of the dead from amid the living, and the general sanitary operation of the services of the medical officers of health—which would include those of sanitary inspectors—those undertakers interposed the observation that the examination of the causes of death by responsible sanitary officers would serve to check secret murder, for they (the undertakers) had sometimes to close the coffin upon a case which they believed to be a “foul case,” but which it was not their function to challenge or to examine. And this great evil, more or less, continues. His great sanitary ally and friend, Dr. Richardson, had declared that he did not know one medical man of extensive practice who, in the course of it, had not met with a case of secret murder. Now, as there are more than eighteen thousand practitioners in this country, what does not such a fact as this disclose of evils of insecurity of life, calling for protection? One sanitary fact ascertained was this: that the interment of bodies in single graves, with a sufficient amount of soil, and with vegetation above, with coffins with bottoms that were impermeable, preventing leakage into drains or water-courses, but with basket or permeable covering—all were proved to be cheaper than cremation was

then. This might be accomplished by cemeteries on a large scale, responsibly conducted. The Commissioners had provided a more effective solemnity at interments, that would be elevating and gratifying. It was observed that men of the laboring classes frequently subscribe all life-long in associations solely for the provision of an interment with a ceremonial, such as the Foresters. Upon any of these a large advance would have been made for the satisfaction of the poor. It was shown that the funeral expenses, as well as the expenses of interment, were reducible, on a public footing, to one third of the usual amount, and that, too, with large reductions of sickness and mortality. It was shown in a second report, printed under the auspices of the First General Board of Health, made in 1850, that a reduction would be made in the funeral expenses as well as the expenses of interment, of fully one third of the previous expenses. Now these reports have been long out of print, and long forgotten. Perhaps there was no existing member of Parliament who had ever read them. Yet they contained sanitary and other matter entirely new to the present generation. He submitted that these reports ought to be republished in a convenient form, perhaps with now improved chances of proper attention. He had no subsequent information or conception of any advances made, as some might be, no doubt, on previously gross conditions. It was a great case, however, for re-examination as to the existing conditions.

After some further discussion, Mr. Chadwick moved "That the Home Secretary be requested to apply to the President of the Local Government Board to direct a re-examination of the existing conditions of interment, chiefly, in the first instance, those of the metropolis."

The Lord Mayor of York suggested that the examination might be extended at once to such cities as York and Manchester, which he was assured required it.

Mr. Chadwick assented, and the resolution was passed unanimously; also one requesting his Grace, the President, to move for the reprinting of the official Reports on Interments of 1843 and 1850.

Ultimately the report was adopted, the meeting concluding with thanks to the Duke of Westminster and to the Bishop of Gloucester for the parts they had taken in the subject.

SERVIA'S SANITARY SYSTEM.

IN these times of effort toward a thorough, a rational supervision and control of matters affecting the public health, physicians and others may be interested to know the *schema, in re*, formulated by a very young member of the comity of nations.

An experienced economic observer and philosopher (De Laveleye) reports that, in Servia, the "general sanitary council" of seven doctors is a scientific consulting body for the State; its duty is to study and regulate measures adopted by the "sanitary department," whose functions are executive. The "sanitary department" is under the authority of a surgeon-general, with an inspector-in-chief, secretary, two chemists, and a veterinary; its sphere comprises everything relating to health, including even the food of the people; obligatory rules in regard to the diet of workingmen are numerous and minute.

The national administrative *cadre* is paralleled by the medical. The *préfet*, or departmental governor, has the aid of a doctor, correspondent in grade, and nearly as well paid; the heads of districts and communes have, likewise, medical advisers, receiving the same salaries. Midwives and veterinaries are subordinated to this "department." In each town of importance the physician has a right to form part of the municipal council or board of aldermen.

The country is, therefore, as to hygiene, in the hands of medical men—a national board of health, with proper sub-officials—empowered to inspect and dispose all things concerning the physical well being of mankind and of domestic animals.

We instance a few details by way of illustration: Every child must be vaccinated between the third and twelfth month; again when leaving the primary school; and once more when twenty-one years of age. This operation, free and compul-

sory, is performed from May 1st to September 30th, under superintendence of the *préfet* and departmental surgeon, in presence of the mayor. The proper medical officer must inspect inhabited houses, and remove causes of illness arising from poor food and water, defective drainage, and from customs relating to births, burials, etc. Buildings where there are contagious diseases have descriptive labels affixed. (A similar rule is followed in Holland.)

In the care of public health, the government has not feared to make regulations forbidding a secular usage, closely resembling a religious rite. Certain church followers had the habit of carrying their dead to the cemetery in an open coffin, the face and body covered with flowers; under the new *régime* a closed funeral case is requisite. The question of cremation—a safer mode for the oxidation of organic substance that must decay and may spread disease—appears less urgent for consideration there than in our own territory. Strict and detailed directions exist to stop the progress of infectious maladies, both on the frontier and throughout the kingdom.

Some of the so-called civilized nations have done much to improve the qualities of race in domestic animals—the lower animals, as sometimes called; whereas the procreation of nature's highest kind of life, whereon intellect has been grafted (or wherein it is developed), is left, for the most part, to unreasoning impulse—with results that every informed and thoughtful mind can but deplore. In this newly-formed European commonwealth, however, the function of the departmental doctor is to trace how marriages are made, if they produce hereditary affections, what is the average number of children to each union, and whether there are limiting causes. Under penalty of disciplinary punishment, the medical officer is to obtain from the *préfet* measures to abolish, in workshops and private houses, "everything that may injure health."

It is a subject for serious thought whether it be wise to place citizens under the tutelage implied by such an extensive officialism. Nevertheless, so complete a system, earnestly applied, would without doubt save from much pain and sorrow not only the average man, but also those who, in a sanitary and physiological point of view, ought never to have been born.—*Boston Medical and Surgical Journal.*

THE ENGADINE AND DAVOS.*

By D. B. ST. JOHN ROOSA, M.D., LL.D.

DURING the last summer I have had an opportunity of revisiting the famous Engadine Valley, and also to see for the first time Davos and Wiesen. As this society well knows, much has been written, both in England and in this country, upon these high health resorts, especially as to the fitness of an abode in them by consumptives during the winter. On the question as to whether places of great altitude are suitable and recuperative for phthisical subjects I shall have nothing to say, for I have no especial experience that fits me for any expression of opinion upon this point. All I shall attempt to do is to make some remarks, founded upon observation, as to what may be actually found in the way of air, food and drink, living accommodations, and so forth, by those who are sent to the Engadine and the contiguous regions in summer or winter. Such remarks may possibly be of some service to those physicians who, while well acquainted with the claims made for great altitudes and so-called aseptic air for their patients, do not know by actual visitation what is to be found in the details of living.

A journey across the Atlantic is only the beginning of the long journey to the Engadine or Davos. Yet many Americans, if they become invalided, for various reasons prefer to go to Europe than to Colorado or California. One reason for this is to be found in the fact that they believe that, after the tedious journey is over, the older civilization will make them more comfortable in such matters as a bed and room, places to walk and sit, and food, than will the younger one in our own country. It seems to be a fact that European hotel-keepers are more eager to meet and less impatient to fill the little wants of invalids, or even of ordinary travellers, than are the same class in America ; hence European hotels are gener-

* Read before the American Climatological Association at its fifth annual meeting, September, 1888.

ally more comfortable than those of America. I am often surprised at the haphazard way in which invalids are sent across the ocean, and at the very inadequate preparations that are made by them, and by delicate persons generally, for the passage. There is really no place where more care is needed to secure proper food and to wear proper clothing than upon the ocean. A voyage across the Atlantic is not of necessity a health-giving process. To nervous, jaded people, overladen by cares at home, it generally is ; but a person with a cough, or one who is inclined to be constipated, or a dyspeptic, may pass off the steamer, unless great care be taken, worse than when he went upon it. In the summer-time steamers are now so crowded that the opportunities for fresh air even on deck have become limited, while for exercise there are on many vessels none at all. But in the autumn or winter these conditions are improved, and then the passages are rough. In spite of the landsman's tradition that one never takes cold at sea, it is an uncommonly good place for an attack of coryza, tonsillitis, and bronchitis. Invalids starting for a foreign health resort need as careful advice for the steamer journey as for their abode at their destination. They who get it from the surgeon of the vessel are few. One reason is that they scarcely ever ask for it, and another that the medical officers are not always men of experience enough to properly advise the passengers. An invalid or delicate person at sea should have the daily care of the surgeon, who ought to see that such passengers are fed with system and care. No happy-go-lucky belief that all will go well if they simply breathe the salt air should be encouraged. I know of but few more oppressive places than state-rooms in which the ports are not very often opened, and overcrowded cabins of large steamers.

Once on the coast of Germany, Holland, or France, in Bremen, Rotterdam, Antwerp, or Havre, the invalid will have a long railway journey before him, which should certainly be broken, for only under exceptional circumstances or at great expense, such as is incurred by hiring a *coupé lit* or berth in the few Pullman cars, can accommodations equal to those easily obtained in the United States be found. I refer chiefly to the absence of cabinet and lavatory arrangements in the railway carriages. It is only rarely that they are found. Their

absence is a great evil even to well persons, who can jump from a train when it stops five minutes, and run an eighth of a mile to empty their bladders ; but what is this abominable system to delicate men and women and those travelling with young children ? I have seen a lady, at last forced to it by the long journey without an adequate halt, hold her little boy up to the window and allow him to urinate in sight of the crowded *coupé*, much to her mortification. Many more distressing scenes than this constantly occur. The danger of murder in the English and French railway carriages is one that experience shows is not entirely without foundation, and yet the British and Continental railway authorities move very slowly in the reform of their carriages.

If the Engadine be approached from the Swiss side it will probably be from Chur (Coire), about twenty-six to thirty hours from the coast. Here good carriages may always be obtained. But the trip, which is one continual ascent, should not be made in one day, although the longest route to the Engadine is only from fifty to sixty miles. The average American wit and caution should be used in selecting a driver and a carriage. The sleeping accommodations, even in very humble and remote places, in Switzerland are exceedingly good. A clean and soft bed, and nutritious food, generally well cooked, are almost always to be obtained. The routes from Coire to the Engadine or Davos are no exception to this. I will not break the continuity of my paper by asking if these things are to be found, as a rule, outside of the great cities in our own country.

The Engadine, with its history and the character of its inhabitants, has much to interest us aside from its fame as a health resort. The Germans were the first to utilize the valley as a curative place for consumptives, although the question of the suitableness of high altitudes for them is by no means a new one. Dr. Tucker Wise* shows that here also the practical wisdom of our time was foreshadowed by the older writers. Dr. Bodington, of Warwickshire, forty-five years ago, said : " To live in and breathe freely the open air, without being deterred by the wind or weather, is one impor-

* " Alpine Winter in its Medical Aspects."

tant and essential remedy in arresting the progress of phthisis. . . . The cooler the air which passes into the patient's lungs, the greater will be the benefit the patient will derive." Dr. Bodington called cold, pure air a sedative to the lungs. I suppose the writers of the present day are a little more specific when they claim that it is *aseptic*, or that it has germ-destroying qualities.

The Engadine Valley, as is well known, is a small one—about sixty miles long and about a mile wide. There is scarcely any agriculture. The Alpine grass is all that can be cultivated. The larch and the pine grow upon the lower parts of the mountain. The clearness and apparent purity of the atmosphere in summer would strike even a careless observer. It is a joy to exercise in it. But the Engadine is usually cool and often cold even in July, and very cold in winter. To use an old quotation of mine from a witty Frenchwoman, whom I saw at St. Moritz two years ago, "You can walk in the Engadine, but you cannot sit down." The various places in which invalids congregate in this region—St. Moritz, the Maloya, Samaden, Pontresina, and Davos and Wiesen, on the other side of the valley—are well provided with the facilities for sitting down by the wayside, as they are with many other conveniences for invalids. To this there is one exception in the summer-time, at least; I found but in one place, and that the Hotel Maloya, anything adequate for keeping one's self comfortably warm in the house. The guests of the hotels went about with overcoats, and even men sometimes dined at the *table d'hôte* with shawls over their shoulders. Since St. Moritz is more than six thousand feet above the sea, and Davos nearly five thousand, there must be many cold days in summer even when the sun is fully out. In summers like those of 1886 and 1888 no invalid—indeed, no person of average health—could be comfortable in the reading-rooms or drawing-rooms of the hotels for much of the time unless wrapped in furs. To secure a fire in one's bedroom, except in two of the hotels in St. Moritz Baths, was not difficult. The rooms are heated by iron stoves, constructed on the vicious principle of radiating sufficient heat about an hour or so after they are heated by a small wood fire. This works fairly well in porcelain stoves such as are used in North Ger-

many, but I have never seen it do very well in those immense iron cylinders in vogue in other parts of Continental Europe. One hotel in Davos has a few open fires, and I saw an American coal-stove in a dining-room of another hotel in the same place. The hotel proprietors in Europe, as in America, are very reluctant to admit that a public room needs a fire in the summer, although they are often the losers, in consequence of their unwillingness to keep them warm, in the short residence and early departure of their guests. Inasmuch as invalids cannot always be in the open air or go to bed directly they are indoors, this failure to keep a comfortable temperature is very trying. In the hotel at Maloya there is a system of heating that I found very pleasant in the three days I was there in August. One of these days there was a snow-storm. The outside air is warmed by passing over steam-pipes, and then by a system of registers is let on or shut off in the various rooms.

It is not, however, in summer that the question of life in the Engadine or Davos is of the most importance. Although many invalids stay there all the year round, they are chiefly important as health resorts in the winter. The Engadine, however, is crowded with wealthy and fashionable people in the summer. It is the *mode* to go there to stay a few weeks, especially among the English and the Anglomaniacs. The former are so accustomed to fog, rain, and cold that I do not wonder, with their aptitude for walking, that they put the clear sky of this region and its invigorating air high up in the scale of pleasure as well as health resorts. The waters of St. Moritz have no very great therapeutic value, I fancy. They are predominantly iron, apparently not so much impregnated as many others in Europe and our own country. Pontresina has no waters and few attractions except to Alpine climbers and hale pedestrians, and yet it is so crowded in summer by many people who cannot be said to belong to either class that rooms are not easily obtained unless by writing long in advance. The village is small, its streets narrow, and they are redolent with the very prevalent Swiss odor in small villages, that of manure. The hotels, except one, are badly situated. Yet a good deal of what the French and Italians are so fond of calling English and American *high life* fills Pontresina.

Although there are two glaciers and no end of Alpine meadow at Pontresina, it is hard to conceive how the Maloya, with its free expanse of unoccupied territory and its excellent and well-situated hotel, remains half filled, and even then with some impatient people waiting for poor rooms in the gorge-like streets of little Pontresina.

Some people find all ascents, even going upstairs, noticeably more difficult in the Engadine than in ordinarily situated places. Usually only the extreme clearness and purity of the atmosphere are perceived, even on first arriving. It should always be remembered that life in the Engadine is about six thousand feet above the sea, and that not every invalid or even healthy person can tolerate it. An old American gentleman died at one of the hotels, just before I arrived, of cerebral hemorrhage. His physician told me that he thought that death had been precipitated by his visit to such a region. It is certainly manifestly unfit for persons of full habit and with very weak hearts or weak blood-vessels. Certainly patients should not be sent off to the Engadine by physicians without some consideration.

Davos, so famous in our time, is situated in what Badeker calls a *district* of that name in the same canton with the Engadine Valley, and was until within a few years so isolated that the guides used to speak of it as a place in which no foreign foot ever trod. The inhabitants generally state that no one born in Davos ever had consumption, but, of course, it is impossible to verify such a statement as this. The district is also a high valley, but only eight miles long and half a mile broad. It is remarkably well sheltered by high mountains, and must be freer from wind than the Engadine. The growth of small pines is profuse and beautiful. It is a thousand feet or so lower than St. Moritz or the Maloya. It is a charming region, the air being apparently as clear and as aseptic as that of its higher neighbor. Davos place and Davos village are about a mile from each other theoretically. They almost connect, however, and the two places are rather thickly populated if, as I was told, there are two thousand invalids there in winter, besides their attendants and the inhabitants of the very small villages around which the hotels have been built. At St. Moritz village there are about two hundred invalids at the

most in the hotels, and at Maloya fifty, in one. The baths at St. Moritz, a mile from the village, are closed in summer. It is evident that the large population in Davos may become a source of danger, as in Pontresina in summer. Yet I have a belief that the watchful Englishman to whom we are indebted for the great improvements in water-closets and urinals throughout the continent of Europe will see to it that the sewage does not contaminate the water, and that the closets are flushed. There is much reckless behavior by Americans, sick and well, in many of their habits, and some of it consists in their drinking water in all kinds of places, with no inquiry as to its source or liability to contamination.

Teetotal principles are at the bottom of some of this lack of wisdom. To those who have conscientious scruples against wine, tea and coffee, natural mineral waters furnish a resource. There are about a dozen hotels in Davos *Platz* and two or three in Davos village, all in the space of about two miles in length and half a mile in width. The closets of the various hotels are generally of an approved variety and are kept in order. The water-supply is apparently not contaminated. The milk furnished at Davos is of excellent quality. Watered milk and a queer-tasting white fluid sold for milk are not uncommon in British and Continental Europe. On the Isle of Wight, especially at Ventnor, where is the hospital for consumptives, at Davos, at Maloya, milk may readily be had as good as that of the Echo Farm and other famous places in America. The food furnished at the *table d'hôte* breakfasts and dinners in many of the hotels is not nourishing enough, although the courses are sufficiently numerous, for an invalid or delicate person, and I would advise such persons to see to it that they have an honest beefsteak or a large slice of beef or mutton in addition to the thin soup, the inch of dry beef or veal, and half a leg of chicken that go so far to make up a Swiss *table d'hôte* dinner. This can always be had by paying a very little extra or by dining or lunching by one's self *à la carte*. Board is not high in Davos. I have before me a card of one of the hotels frequented chiefly by English and Americans. A room and board, breakfast (coffee and rolls), dinner, and supper may be had at from six to twelve francs a day, according to the location of the rooms. Milk and wine are

extra. The latter is also good and cheap. There are donkeys and bath chairs and horses and carriages at reasonable rates, and no end of tobogganing in winter. Indeed, all the active invalids are said to spend all their waking hours, except when eating, in the latter employment. One end of the town is devoted to the Anglo-Saxon, since only English and Americans live there, while in the other live those whom the Briton, no matter in what country he may happen to be domiciled, speaks of as foreigners. They are Swiss, German, Dutch, and French, with now and then a brave American who speaks one language besides his mother tongue, and who does not like the English to the exclusion of all others.

Wiesen, twelve miles below Davos, should have at least a word in an article on the high health resorts of Switzerland. It is hardly a village, but it has two pleasant hotels situated beautifully on the sunny south slope of a very high mountain. The place itself is more than forty-five hundred feet above the sea. Like Davos, it is well sheltered from the winds. Beneath it is a beautiful and rapid stream of water. It is recommended by Dr. Wise, of Maloya, as an excellent stopping-place for those leaving the higher lands in the spring. It has, however, intrinsic qualities in beauty of situation that make it apparently very desirable for a consumptive's winter or summer abode.

There are many other things observed, even by one who cannot lay any claim to give expert testimony on high health resorts for consumptives, that might be narrated, but perhaps what I have been kindly allowed to say to you may supplement more recondite experiences, and turn the attention of the society to a study for themselves of the authorities who treat more exhaustively of the effects of great altitudes upon diseases of the chest. It ought also to be noted that pernicious malarial infection, or chronic malaria, would without doubt find a cure in the Engadine or Davos. But this may be obtained much nearer home, in many of the counties of New York State, such as Sullivan, Delaware, and Otsego. I met a young American physician at Samaden suffering from the effects of Chagres fever, who had been advised to go to Davos, and I afterward saw him at the latter place, much improved in a few days. He assured me that the profession at home would still welcome notes on these regions.

In visiting these places, a very natural inquiry occurs to every professional mind : Do patients actually recover from tuberculosis by living in them ? Certainly a summer visitor cannot answer such a question, and perhaps no one but a resident physician of a judicial and conservative temperament can ever do so, and he only by a ripe experience and careful record of his cases. But, on superficial observation, this much seems to be shown : life is made much more comfortable and is prolonged to many by an abode in these altitudes. A few are cured of something, and become well enough to go home and live out their days. A frail, coughing young lady, with a hectic flush, said to me : " I have lived here three years ; I am no better, but I am no worse, and I am happy." In Davos, St. Moritz, and the Maloya the invalids and their friends form a happy family. Even a young man without acquaintances soon becomes at home and shares in the common interests. Everything centers about the invalid ; all is done to prolong and save his life. The tone of the little society is a cheerful one. Not many deaths occur, since advanced cases rarely go to the Engadine or Davos. Altogether the exile, although an exile, is a happy one, so sweet is life and the hope of life to the human heart.—*New York Medical Journal*, September 29th, 1888.

CIDER.

IT is surprising that of the three principal European beverages, wine, beer, and cider, so little attention has been paid to cider in comparison with the other two. Wine is ancient and classical, and was no doubt the first invention to cheer the heart of man. It was a simple and natural thing to do, to press the fruit for the sake of drinking the juice, to keep the juice awhile and thus discover that there was a cheerfulness imparted to it, to keep it a little longer and find it vinegar and disappointment, and then to invent the method of staying it at the cheerful stage and preventing it from proceeding to the sour and vinegar stage. The process of distilling must have come long after this, and if it had never been

discovered the sobriety of man might not have been alarmed by such a meaningless medley of words as the Blue Ribbon Gospel Total Abstinence Association. To this day grapes are pressed by the naked feet of women dancing on the masses of fruit to the sound of the fiddle and the lascivious pleasing of the lute, a custom which must be very ancient. The proper making of wine is an art demanding great skill, and the juice of all fruit is so delicate, the chemical changes are so subtle, that a long experience and considerable ingenuity are required to prepare it for transport from the place where it is made to other climes. There are few wines that do not taste far better where they are made than elsewhere, and there are many very delicious wines that are never tasted out of their own country. The art of wine-making has been brought to the greatest perfection at Bordeaux, and it is from thence that the pure juice of the grape is carried to other countries and drunk in a perfect state.

What a fine national beverage we should have if the same pains and skill had been bestowed on cider ! Cider is an innocent and delicious drink, with a much lower alcoholic strength than most natural wines, and far better than all the common wines below those of a high class. It is in general use in the western counties, Devonshire, Somersetshire, and Herefordshire, especially. It is commonly made and drunk on the premises—that is to say, there is an orchard on every farm, large or small, and the cider is made for the family use, including the men employed. This is what is called rough cider, and the quality depends on the situation and the season. On large farms, or at the squire's mansion, it is often when just made put into an enormous cask, constructed by a professional cooper within the cellar, much too large ever to have been put into or taken out of the cellar, and then drawn off the lees for use ; there is no better way of drinking cider than this, a case in which the liquor after having been made is not moved at all ; and your real west-country cider-drinker likes his cider with no nonsense about it, sometimes giving a preference to it when it is what he calls *rash*—the word being applied to the cider, and not to the drinker, as the ignorant might suppose. There are many definitions of a gentleman, of which “ to set in the chimbley cornder, drink zider, and

cuss" is one to be heard of to the westward. Whether it is particularly human to like variety in eating, but to become strongly attached to the accustomed beverage in drinking, we will only hint to the psychologist and physiologist ; but certain it is that the fondness for cider in cider countries is extreme, and its alcoholic strength is not enough to make it injurious. It is recommended for gout, and is well known to the aforesaid westward to be a complete cure for all the ills that flesh is heir to. Two men have been known to sit down before a hogshhead of cider and not leave it till it was empty, being none the worse for it. Can anything more be said in the praise of cider ?

Mr. H. Stopes has recently published a book on cider ; and the Royal Agricultural Society's Journal, 1888, Vol. XXIV., Part I., just published, contains a report on "Recent Improvements in Cider and Perry-making, by Mr. D. R. Chapman," which fully explains the whole process. It would appear by these publications that cider is coming into vogue, and well it may, for there seems to be no good reason why such quantities of low quality wines should be imported from France and Germany, while there is at home what we venture to say is a finer fruit from which a better beverage is made, always excepting the higher class of wines. We have heard of cider, in the early part of this century, made entirely of the golden pippin, a delicious apple, unhappily extinct, worn out by constant grafting, and this cider may have rivalled any wines. There is the cider made for home consumption, and the cider made for sale ; and presuming that the cider made for sale is well and honestly made, which is usually the case, there is still a great difference in the two. The orchard affords a very profitable crop, even if a really fine apple season comes but once in three or four years, and in these days of agricultural depression to promote the cultivation of apples and the consumption of cider is a benefit to mankind. The apple-tree takes some years to get into good bearing, and the right sorts are not easily obtained—facts which may certainly account for a great deal of neglect in the growth of this crop. But it is well worth while to plant the trees, well worth while to get grafts from the best sorts, and well worth while to pay more attention to cider-making than has ever been paid be-

fore. Mr. Chapman, in his Report to the Royal Agricultural Society, gives a list of the favorite apples in the cider counties used for making cider. They should be apples which ripen toward the end of October, that the temperature may not be too hot or too cold for the fermenting processes. A certain selected variety of sorts is now preferred, but in the case of the golden pippin the finest cider was made from one sort only, and it is probable that the wine-growing countries can correct us in this particular. The orchards of Devonshire, Somersetshire, and Herefordshire are gorgeous to behold twice a year, when they are in blossom and when the fruit is ripe, the branches laden with rich reds, yellows, and browns, and the air sweetened with the fruity scent. The fruit should be very carefully picked, or allowed to drop on very soft ground, and placed in small heaps to ripen fully, great care being taken that no rotten apples are used. On some farms rotten apples are used freely, an economical superstition which, like all other superstitions, is wholly condemned by the holders of the true faith in cider. Another heresy is that a little water improves the cider, which is also an economical superstition. When ready the apples are crushed, and this is best done by the old-fashioned granite-stone roller and trough. In the modern contrivances iron and lead may come in contact with the juice, which is bad for the cider and the cider-drinker. When the apples are well broken up they are placed in large wooden tubs—a wine-butt with the head taken out is a very good receptacle—and allowed to stay twelve to twenty-four hours or more, during which time a scum is thrown up, and the broken apples assume a brown color, which is imparted to the cider. The broken apples, called “math,” “cheese,” or “cake,” according to the county, are then pressed in a press constructed for the purpose, several layers, separated by haircloth or very clean straw, being pressed together, and the juice as it runs out is caught and transferred to tubs, sherry hogsheads, and sherry butts, with the head out being preferred, when the process of fermentation takes place. Small farmers do not keep a press, but take their math or their apples, as the case may be, to a public press, or pound, as it is sometimes called. The cider cannot, however, be so carefully made as it is in a press kept by the maker himself. For home

use the fermentation is allowed to go pretty far, and the cider so much esteemed by the natives is produced. It used to be freely sold by the publican, and a man could go to a public-house, drink his cider and have his talk, and go home none the worse. But now beer and spirits, adulterated, pay the publican much better than simple cider, making a man more thirsty in lieu of quenching his thirst, and cider has gone out of fashion with him—the more is the pity. The cider which is made for sale, bottled in champagne bottles, and sometimes sold as champagne cider, though sparkling cider would be a much better term, is more carefully prepared. The fruit is selected for the purpose from the best sorts, and the juice after having been pressed out is racked from cask to cask, and treated with sulphur to check fermentation, as all wines are treated at Bordeaux. The use of sulphur is locally and contemptuously called *matching*, for your real cider-drinker likes his liquor sharp and stringent, despising the soft sweet cider of the stranger. Sulphur has the effect of destroying the vitality of the yeast, and is used freely in making the clarets and the delicious Sauternes of the Garonne. In the following spring of the year, the cider having been pressed the previous autumn, it is ready for sale in casks or bottles. It is sometimes sweetened for the public taste, as in the case of champagne, when the finest sugar is used, and if bottled properly, whether sweetened or not, it will effervesce as champagnes do. Bottled sparkling cider is the best beverage for India, far more wholesome than champagne or pale ale, probably from its lower alcoholic strength, and is very much in demand there. The price is ridiculously low in comparison with champagne, and always excepting the finest brands, which, however, may be rivalled, it is a better drink. A second Bass should arise in Devonshire and devote his life to making cider for the benefit of man. From the valleys of the Exe, the Dart, and the Tamar, where the best cider is now made, a sparkling liquor might copiously flow which so-called total abstainers might greet with favor, and the heart (or mind is it ?) of man might be cheered and not inebriated.—*The Saturday Review.*

THE LOCALIZING CONDITIONS OF CHOLERA IN CALCUTTA.

By J. A. S. GRANT-BEY, M.D.

(*Translation from the Arabic Medical Journal "Al-Shifa."*)

AS a comfortable but delusive impression seems to be spreading with regard to the sanitary condition of India, and of Calcutta in particular, it may be well to direct attention to the actual state of affairs. It is impossible to speak of the filthy condition of the broad fringe of hamlets by which Calcutta is surrounded without using forms of expression which must seem exaggerated when judged by an ordinary standard. But the fact is, there is no possibility of exaggerating either the horrors of the hamlet-world or the manifold dangers by which, owing to the lethargy of the local government, the city of Calcutta is encircled.

Far from matters being improved, they are growing rapidly worse, and the only effect of the trivial action into which the municipality has been goaded is to create a false feeling of security in certain quarters. That there will be a terrible awakening one of these days is the conviction of every one who has the slightest acquaintance with the subject and who brings to it an unprejudiced mind.

For some years past Calcutta has been fortunate in escaping one of those visitations which strike terror into the public mind, and reassert the devastating power of epidemic disease. But a peep at the hamlets will amply prove the folly of believing that the present immunity is likely to be more than short-lived, for nothing has been done in the way of prevention that is worth one moment's consideration.

It has come to our knowledge that during the first week of December, 1887, a gentleman of Calcutta visited one of the hamlets in the suburbs of the city, and his description of its unsanitary condition was considered worthy of a place in the

March number of *The Journal of the Health Society for Calcutta and its Suburbs*. We have thought that by publishing a *resumé* of what he reported our eyes might be sufficiently opened to the risk we run by being next-door neighbors, and that we might be on our guard against the importation of transmissible diseases.

He reports : I went to the hamlet called Kurryah, and it is conveying a very feeble idea of what I saw to say that the condition of the people is simply frightful. Here we have a group of closely built huts crowded with people. The land on the south side, not twenty yards distant, is used for curing skins. It is needless to say that the stench is sickening, and that the air is thoroughly saturated with it. The whole are, including a number of foul places, drains into what seems to be a blind ditch, which is accurately described as a bubbling, scum-covered, seething mass of utter corruption. A few huts separate the ditch from two tanks, one of which is covered with green scum, and is used for bathing and for washing utensils, clothes, etc. This tank is separated from a second, to the east of it, by a "*bund*," or earth-dike, about five feet thick ; not thick enough, however, to prevent percolation. The water in these two adjoining tanks is at the same level, and percolation evidently takes place freely. The water in the second tank is free from vegetable scum ; but it is not clear water, and it abounds with low forms of life.

On my visit to this delightful (?) spot I had a companion with me, and the object of my search was to find out the sanitary conditions in the midst of which a recent and fatal case of cholera had had its origin.

The whole of the people of the neighborhood use the second of these tanks for a drinking-water supply. Further, we ascertained that from thirty to forty cases of cholera occur in the vicinity every year.

We had the tank-water microscopically examined, and it was found to be teeming with life. Perhaps its worst feature was that the forms of low organisms which are to be found in fairly pure water were conspicuously absent. Under these circumstances the mystery is not that there is illness about the place, but that any one can live there in ordinary health, even for a few weeks.

Now, I wish to lay stress upon the fact that there is not a word of this statement introduced for sensational effect. The picture is very far from being over-colored.

The hamlet here described is a real, every-day aggregation of huts, neither better nor worse than hundreds of others. It is a thoroughly typical hamlet in all its wretched features—an ever-active centre for the propagation of the most dangerous forms of disease that threaten the health of a vast European and native community.

When, I would ask, will the municipality realize that its paramount duty is the removal of such plague spots? When will it begin in earnest to grapple with the evil which exists at our doors and threatens the public health at every moment? The fact I am most anxious to emphasize is that, in spite of all that has been said, and even of the stern remonstrances of the supreme government, the municipality has practically done nothing to even mitigate the unsanitary condition of the city, and to remove the reproach which is attracting to Calcutta the attention of the leading European authorities on sanitary matters.

We say the above is an instructive study for the Quarantine Board at Alexandria, because the narrative is by an eye-witness, and is not simply a telegraphic despatch.

We shall give in our next article an account of a cholera-stricken village in the suburbs of Calcutta in December last, and of how the authorities cloak the truth so that it is not known in its naked form to the outside world.

The Egyptian Sanitary Department may well congratulate itself that there is at least one other country in a worse sanitary condition than Egypt. But this is no reason why it should "rest and be thankful." There is yet much to be done to improve the demographic statistics of Egypt. In Cairo we are having just now a mortality of 80 per 1000, and it is on the increase; and who knows what it may be in the villages where stinking pestilential ponds serve for the water-supply to man and beast at low Nile? We feel sure that the mortality of the inhabitants during the summer months would diminish one half at least if the people were furnished with potable water; and we cannot conceive of anything more feasible and inexpensive than the old system of storing the

high Nile waters in *sahareegs* (cisterns) to be used during the period when the Laboratoire Khediviale will tell us that the Nile water teems with disease germs. This period, we judge from experience, without any microscopic research, lasts from two and a half to three months. In Cairo, no doubt, the water company would, for a consideration, fill the three hundred existing cisterns at the proper time ; and as to the villages, each village could make its own *sahareegs* and maintain them in good order. In another article we mean to touch again upon this subject. In the mean time, we assert that the Nile from about the middle of May to the middle of August is little better than an open sewer, and its water at that period, however well filtered, is not potable, and its use as such leaves no doubt in our minds as to its influence on the demographic statistics.

In a private communication addressed last month to the director of the Sanitary Department (for which, we have to admit, we got no thanks) we referred to the unhealthy condition of the Nile water at this season, and to the admirable system the Arabs had formerly of storing high Nile water for a drinking-water supply at low Nile.

We are glad to see by the newspapers of the 26th of this month that our suggestion has not been thrown away, for the Sanitary Department has now advised the government to construct a large reservoir for the city of Cairo ; but it will have to be more scientifically constructed than the new ones at Sheheen el Kom and Damietta, else we shall have percolation or rupture and a second deluge.

By boiling the Nile water at this season, no doubt a great number of pathogenic germs would be destroyed ; but for one who would boil one's drinking water there are thousands who won't. Hence we are driven back to the time-honored *sahareeg* system.—*Albany Medical Annals*.

DANGER OF FLOUR-DUST.—An explosion of flour-dust in the National Flour Mills of Cleveland a month ago, killed two men, severely injured four others, and caused a loss to the property of over a hundred thousand dollars. The explosion shook the earth for a mile around. The cause of the explosion has not been ascertained.

THE VALUE OF CORROSIVE SUBLIMATE AS A PRACTICAL DISINFECTANT.

By WILLIAM B. HILLS, M.D., of Cambridge, Mass.

IT is only within a comparatively few years that the exact nature of infectious material has been determined with any approach to certainty. Previous to this time, our knowledge of the relative value of disinfectants was necessarily very inexact, and their mode of action, although the occasion for numerous theories, entirely unknown. It was assumed, however, that infection had its origin in putrefactive processes. Any substance, therefore, which arrested such processes, or destroyed their chemical products, was considered to possess more or less value as a disinfectant. The only known test of the efficiency of these was their power to arrest decomposition, and this was determined by the presence or absence of odor.

Investigations of recent years, however, have proved as exclusively, perhaps, as is possible, that certain infectious diseases are caused by micro-organisms. Consequently, all processes of disinfection are now based on the view that all such diseases are caused by micro-organisms, or by poisons which are produced by the vitality of such micro-organisms. In the present state of our knowledge, therefore, we consider as disinfectants those substances only which have the power of destroying the vitality of micro-organisms.

When the various substances formerly employed as disinfectants were measured by this test, it was found that nearly all of them are much less valuable than was formerly supposed; while some, including ferrous sulphate and the salts of zinc, which had for some years been considered of inestimable value, are absolutely worthless. The hypochlorites, which have always occupied a prominent place in the list of disinfectants because of their power to destroy organic matter and the chemical products of putrefaction, were found to be in fact very efficient; though it is probable that, as they had been

hitherto employed, they were more often inefficient than otherwise, owing to a lack of any definite knowledge regarding the proper amount to be employed. With this exception, however, the only metallic salt found to have distinct value for practical disinfection was corrosive sublimate. This salt had been recognized for many years as an efficient antiseptic, and had also been included in the list of supposed disinfectants; but it had not been shown, by the tests employed previous to 1880 or thereabout, to have a superiority over other metallic salts of its class, sufficient to compensate for its expense and poisonous properties.

Our knowledge regarding the relative value of disinfectants as measured by their power to destroy micro-organisms dates from the researches of Robert Koch, published in 1881. Koch found that most micro-organisms are destroyed by a solution of corrosive sublimate of the strength of 1:5000; while a solution of the strength of 1:1000 is fatal to all. He also found that corrosive sublimate has a decided superiority over all other substances as an antiseptic. A solution of the strength of 1:1000000 had a marked restraining power on the germination of the spores of the *B. anthracis*, for example, while a solution of the strength of 1:300000 prevented their development. The results of other investigators, while showing that its antiseptic and disinfecting powers are possibly not quite so great as claimed for it by Koch, still confirm the latter so far as to show that they are considerably greater than those of any other known substance, with the possible exception of one or two other salts of mercury, which for one reason or another are not so available.

As a result of these investigations, and more directly following the recommendations of the Committee on Disinfectants of the American Public Health Association, published in 1885, corrosive sublimate has taken the place, to a large extent, of all other disinfectants, for nearly every purpose excepting aerial disinfection. Every State board of health to whose reports, for the past four or five years, I have been able to obtain access, has published the recommendations of this committee, thus giving them a wide circulation, and nearly every one has distinctly indorsed them as representing the best methods of disinfection known to us. The Board of

Health of Maine alone objects to corrosive sublimate, on account of its poisonous properties, and because it forms an insoluble compound with albumen. Figures showing the exact extent to which it is used, can be obtained, if at all, only through local boards of health, and the reports of these are not easily accessible. There were used, however, in the city of Boston, according to the reports of the board of health, in 1884, 850 pounds ; in 1885, 1550 pounds ; in 1886, 1400 pounds, and in 1887, 2250 pounds of corrosive sublimate for purposes of disinfection.

The value of corrosive sublimate, as measured by its power to destroy micro-organisms in aqueous solutions, is not denied. But the efficiency of a disinfectant, and the amount required for certain disinfection, vary with the nature of the material to be disinfected. The disinfecting power of corrosive sublimate, for instance, is greater in an aqueous solution than it is in an albuminous solution ; for in the latter case a part or the whole of the disinfectant unites with the albumen, forming a compound which has little or no disinfecting power. Thus Klein* found that one and the same kind of blood bacillus was completely killed by an aqueous solution of corrosive sublimate of the strength of 1:25000, whereas it remained unaffected by a solution in nutrient gelatine of the strength of 1:20000 of fluid—or even by a solution in broth of the strength of 1:10000. In all processes of disinfection with chemical disinfectants, we should therefore take into consideration the chemical changes which the disinfectant undergoes when it is added to the material to be disinfected. If we act upon germs in the presence of material which is capable of forming, with the disinfectant employed, inert compounds, it is clear that the germs are likely to escape unharmed, unless we add such a quantity of the disinfectant that it shall be in sufficient excess after the chemical change is complete. Even then we do not attain perfect disinfection, if the inert compounds are such as are able to protect the germs in any way from the action of such excess. This is the case when we employ corrosive sublimate, or any other substance which coagulates albumen, for the disinfection of albuminous material. Under these con-

* Report of the Local Government Board, London, 1885-86, page 155.

ditions a coagulum is formed, and germs included within such solid masses may escape destruction and develop later when the material is thrown into the vault or other similar receptacle ; for the excess, if any, is in turn converted to inert compounds by the albuminous material, ammonia, sulphuretted hydrogen or other substances with which it there comes in contact, or it is so far diluted as to become inefficient.

Considering corrosive sublimate in connection with these facts, we see no reason for denying that it is an efficient practical disinfectant for certain of the purposes for which it is recommended by the committee on disinfectants, and employed in this and other countries ; bearing carefully in mind, however, that its use is for obvious reasons unjustifiable unless we can dispose of it in some other manner than through lead pipes. But for the disinfection of the excreta, vomited matters, sputum, etc., of persons sick with diseases known or suspected to be infectious, or for the disinfection of clothing or bed-linen soiled with such material, it is wholly unreliable, and is so recognized by sanitarians abroad. Yet a solution of the strength of 1:500 is recommended for these purposes by the committee on disinfectants, and following them, by most of the boards of health in this country.

An examination of the report of this committee fails, however, to bring to light the slightest particle of evidence upon which such a recommendation could have been based. The statements made relative to corrosive sublimate are very contradictory and confusing ; the biological tests recorded are few in number and very unsatisfactory ; and the report, as a whole, shows evidence of hasty preparation, and is not at all creditable to the committee. A brief review of the alleged evidence presented by this committee in favor of corrosive sublimate will, I think, prove the correctness of this criticism.

It is to be observed, first, that the committee recognize the fact that the quantity of disinfectant required for perfect disinfection depends upon the nature of the material in which the germs are contained—provided, however, the disinfectant is an oxidizing disinfectant. On page 19 of the report the apparently contradictory results obtained in two series of experiments with potassium permanganate are thus explained : “ The wide difference as to the quantity of the disinfecting agent re-

quired in two series of experiments depends upon an essential difference in the nature of the fluid in which the germs to be destroyed were contained. The large amount of organic material present in the blood, as compared with that in the culture fluid used in the second series of experiments, fully accounts for the difference, for the disinfecting agent is, itself, destroyed by contact with organic matter."

Also, on page 14, we find the following: "The fact that the oxidizing disinfectants are destroyed in the reaction to which their disinfecting power is due, makes it necessary to use them in excess of the amount of organic material to be destroyed; otherwise germs included in masses of material not acted upon would be left intact in a fluid which is no longer of any value for their destruction, and, as a few germs may be as potent for mischief as a large number, there would be a complete failure to accomplish the object in view." The committee make essentially the same statement on page 117, and thus conclude: "The only safe rule in the practical use of oxidizing disinfectants is to use such a quantity of the disinfecting agent that it shall be in excess after the reaction has taken place." But, if it is necessary to take into consideration the chemical changes which take place in the use of oxidizing disinfectants, why is not the same precaution necessary in the use of all disinfectants? For there is scarcely a substance which has been suggested as a disinfectant which may not undergo some chemical change when brought into contact with such organic mixtures as require disinfection, and there is none which is more liable to change than corrosive sublimate. The committee, however, either ignorant of this fact, or forgetting it in their haste, actually use the oxidizing property of the hypochlorites, which makes them the most valuable chemical disinfectants at our disposal (since, if we use an excess, we destroy organic matter and germs at the same time), as an argument against them and in favor of corrosive sublimate, which not only may undergo more changes than do the hypochlorites, but such changes as may render it absolutely worthless.

"For this reason," they say (page 14), "the metallic salts, such as corrosive sublimate, which are not destroyed by contact with organic matter have a superior value for the disinfection of masses of material left *in situ*, such as the contents

of privy-vaults and cesspools. In this case, even if germs enclosed in an envelope of albuminate of mercury escape destruction, they will be prevented from doing mischief so long as they are included in such an envelope, and the wonderful antiseptic power of the reagent used will prevent their development for a sufficient length of time to insure the complete loss of vitality of any pathogenic organisms present." It is, however, a well-known chemical fact that corrosive sublimate is destroyed, or, at least, undergoes chemical changes when brought into contact with organic matter. It is immediately converted by albumen to the insoluble albuminate of mercury. For this reason, albumen is recognized as the most efficient antidote in cases of poisoning by corrosive sublimate. Corrosive sublimate in solution is further decomposed by a very large number of other compounds, organic and inorganic, and by unknown constituents of most organic mixtures. There are but few substances whose range of incompatibilities is so wide. The committee apparently admit the possibility of its uniting with albumen, but think we shall, even then, attain perfect disinfection, because the germs will be imprisoned within the envelope of albuminate of mercury, and will *probably* be prevented from developing. But this is not disinfection. Disinfection consists in the *destruction* of disease germs.

Later, the committee realize their error, and admit the inefficiency of corrosive sublimate for the disinfection of excreta. Sternberg thus writes (page 59), referring to some experiments which show that this substance is not efficient for the disinfection of fresh tuberculous sputum : " The experiments of Schill and Fischer, which I had not read when the recommendation was made (referring to the use of corrosive sublimate for the disinfection of sputum and fæcal discharges), indicate that it will be necessary to use some other agent when the object in view is to destroy the infective virulence of tuberculous sputum. And in general it will no doubt be better to use an oxidizing disinfectant, such as the hypochlorite of soda, when the germs to be destroyed are imbedded in masses of albuminous material ; for such masses are disintegrated and destroyed by oxidizing agents, whereas corrosive sublimate has the opposite effect in consequence of its power of combining with and coagulating albuminous material." And yet the committee has

recommended a solution of corrosive sublimate of the strength of two drams to a gallon of water as equally efficient with chloride of lime for the disinfection of excreta, vomited matters, and sputum. Sternberg himself, in his Lomb prize essay, recommends chloride of lime as the most efficient agent for the disinfection of excreta, and recommends corrosive sublimate as efficient for liquid discharges only. But its value for *this* purpose must necessarily depend on the character of the discharges. If they contain albuminous matter in quantity sufficient to form with the disinfectant a coagulum, they cannot be disinfected by it with any more certainty than can solid discharges. The experimental evidence upon which this recommendation is based will be presented later.

The employment of corrosive sublimate for the disinfection of large masses of material, such as the contents of vaults, cesspools, etc., is absurd, and would not deserve serious notice were it not for the fact that the report of the Committee on Disinfectants, recommending it for this purpose, has been so widely accepted. But the committee, in a note inserted after their recommendations were printed, admit that the complete disinfection of such masses is difficult and expensive, and probably impracticable, and insist upon the necessity of destroying infectious material before it is thrown into receptacles of this kind. This admission, however, appears to be based upon impracticability due solely to expense and obvious mechanical difficulties, and not to changes tending to render the disinfectant inefficient. But, if a disinfectant is for any reason inefficient for the disinfection of small quantities of excreta, it is for the same reason inefficient for the disinfection of large quantities. The action of corrosive sublimate upon albumen is, therefore, a fatal objection to its use for this purpose. But such decomposing masses are constantly disengaging ammonia and sulphuretted hydrogen, both of which convert corrosive sublimate into insoluble compounds, and, owing to the high atomic weight of mercury, these gases fix comparatively large amounts of this metal.

Decomposing excreta also contain alkaline carbonates, phosphates, urea, and doubtless many other substances which react with corrosive sublimate and destroy its efficacy, for there is no reason for believing that any of the resulting compounds have any disinfecting power.

It has been suggested, however, that the albuminate of mercury, which is slightly soluble, has germicide and antiseptic powers sufficient to make it superior to all other disinfectants for this purpose, and that this can be relied upon to prevent the development of such germs as are imprisoned within the coagulum of albuminate of mercury. Professor Vaughan, for instance, considers it probable that the value of corrosive sublimate as a disinfectant is due to the formation of this albuminate ; and Sternberg, in the *Medical Record* for August 1st, 1885, affirms positively that the albuminate is a potent germicide, but gives no facts in support of this statement. Klein's experiments, however, suggest that its germicide power is very slight at the most. Admitting, however, that it has such power, the amount redissolved is very small, and this is likely to be converted at once to the inert sulphide by the sulphuretted hydrogen present.

Used as recommended by the committee, corrosive sublimate is a good deodorizer so far as it goes ; but has no more value probably than the ferrous sulphate which it has to a great extent superseded.

If we examine the experimental evidence upon which corrosive sublimate is recommended as an efficient agent for the disinfection of solid excreta, we find that it comprises ten or twelve biological tests made with pure cultures of micro-organisms, or with broken-down beef-tea, or with semi-solid fæces. Some of these were successful, others were failures. It does not appear to have occurred to the committee that the *nature* of the material acted upon had any influence on the result in the unsuccessful experiments, or that any further investigation was desirable for the purpose of discovering the cause of the failures. But it was assumed that the *quantity* of material was too great for the amount of disinfectant employed, and that, if the latter had been added in larger quantity, or if the time of exposure had been longer, the experiment would have been successful. A liberal allowance was, therefore, made on the side of safety, and a recommendation made accordingly. The evidence upon which corrosive sublimate is recommended for the disinfection of liquid discharges is the following : " The liquid discharges from the bowels of patients with cholera, typhoid-fever, advanced tuberculosis, septic diarrhœa, etc.,

may be fairly compared with our broken-down beef-tea as regards physical and biological characters." The amount required to sterilize a certain quantity of broken-down beef-tea was, therefore, determined, multiplied by two, and the product recommended as efficient for the sterilization of an equal amount of liquid faecal discharge. A recommendation based upon experimental work of this amount and character is not creditable to a committee of the leading sanitary association of this country, and is not entitled to the favor with which the one in question has been received.

The importance of the disinfection of excreta, etc., cannot be over-estimated. It is conceded that such material must be disinfected before it is thrown into the vault or similar receptacle, because of the impracticability of disinfecting large masses of matter. A disinfectant, to be effective, must have penetrating power sufficient to bring it into intimate contact with every portion of the material to be disinfected. Corrosive sublimate does not have this power, owing to its property of coagulating albumen. It should, therefore, be replaced, if possible, by some agent to which this objection cannot be made. We have such an agent in chloride of lime. It has the power of penetration; it oxidizes and destroys organic matter, and it is, in addition, an efficient germicide, bearing in mind the fact that it must be used in such quantity that it shall be in sufficient excess after the reaction between it and the organic material is complete.

Corrosive sublimate, in a word, though a very efficient disinfectant, as measured by its power to destroy germs, is limited in its applications. It can be used for the disinfection of furniture and other articles made of wood or porcelain, or even metal, if varnished, the floors and walls of rooms, such parts of ships as can be reached with solutions, the hands and the surface of the body, and clothing and bed-linen, if not soiled with discharges; in other words, for the disinfection of surfaces which are not themselves injured by contact with it, or surfaces which do not contain material of such a character as to destroy its efficiency. Its use for these purposes is, however, very much restricted, because we have no means of disposing of it, except through lead pipes.


Objections have been made to it because of its poisonous

character. The danger of poisoning, however, is very slight. The solutions employed are very dilute, and its taste is sufficiently disagreeable to attract attention before an amount sufficient to do any injury has been taken. If the solutions are colored, the danger of mistakes is much lessened. The same objection may be made with equal reason against all substances which we now recognize as disinfectants. Care is necessary in the employment of all of them, and those intrusted with their use should be informed of their properties, that all necessary precautions may be taken.

There is, however, one process of disinfection with corrosive sublimate to which this objection may with some reason be made. I refer to its use for the disinfection of streets, for which purpose it has been employed by the Board of Health of Boston for the past two years or more. If its use for this purpose is continued, the time cannot be far distant when the beds of the streets will become saturated with various compounds of mercury. All of these, so far as we have any knowledge of them, are violent poisons. Is any danger to be apprehended from continually inhaling or swallowing, month after month, dust loaded with compounds of mercury? This is a question deserving serious consideration at the hands of the board of health. While not claiming that the process is positively a dangerous one, I believe it is one which involves some risks, and one which it is advisable, therefore, to discontinue. —*Boston Medical and Surgical Journal*, August 23d, 1888.

CATARRH CURES.—A writer in the *Weekly Medical Review* says: "I have collected every catarrh, asthma, and hay-fever 'sure cure' that is in the market, numbering in all fifty-eight, and have carefully examined them. Eighteen of these 'sure cures' are bold-faced frauds. One ounce of quassia chips, a pound of table salt, forty gallons of water, will make one barrel of 'sure cure,' that sells for one dollar a bottle, holding six ounces. The same quantity of water, a pound of muriate of ammonia, a pound of ground cubebs, and a little common potash will make another 'cure' that sells for fifty cents a bottle, holding four ounces. These two are the best of the eighteen frauds."

EDITOR'S TABLE.

 ALL correspondence and exchanges and all publications for review should be addressed to the Editor, Dr. A. N. BELL, 113A Second Place, Brooklyn, N.Y.

THE PROGRESS OF INFECTIOUS DISEASES AND MORTALITY
RATES AT THE MOST RECENT DATES, BASED UPON OFFI-
CIAL AND OTHER AUTHENTIC REPORTS.

THE CONTINUANCE OF YELLOW-FEVER AND ITS CROPPING OUT IN NEW PLACES in Florida is the less surprising the more we learn about the manner of its introduction there.

Since our summary of a month ago, we have received a circumstantial account, which we accept as thoroughly reliable, of *systematic smuggling* by traders in Havana merchandise, in *evident collusion with the revenue officers of the State*, to such an extent as to not only abundantly account for its introduction into Key West in 1886, and again in that city and Tampa in 1887, but for its outbreak in so many other places this year. And the smugglers are by no means limited to the low-lived set to which the man Turk, who smuggled merchandise from Key West while the fever prevailed there, and introduced it into Tampa in 1887, is said to have belonged, but they are so respectably connected with the mercantile thrift of the ports in most facile communication with Havana, as to effectually close the mouths of would-be informers under a stricter surveillance of the revenue service.

We are gratified to be able to state, in this connection, that though correct in what we have before stated with regard to the negligence of proper quarantine inspections last year at Tampa, there is no reason to believe that the Plant Steamship Company's ships have in any instance been the means of introducing the disease; that the ships of this line, while in the port of Havana, are restricted to a clean anchorage at a safe distance from the wharves, and the utmost care is taken by the accomplished medical officer, Dr. Burgess, attached to the

United States Consulate, to exclude all persons, personal effects, and merchandise suspected of danger.

The smugglers use wholly different means, by dangerous craft in clandestine communication with every available port of Cuba and Florida, and are, of all people, the most energetic in their efforts to make it appear that personal contagion only is the means of communicating the disease, while they are actively engaged in disseminating infected merchandise, with the same freedom as any other, wherever they can! And, unfortunately, they appear to have been so successful in creating the impression of personal danger exclusively and diverting attention from their criminally introduced fomites, that many communities have acted upon it and made it the foundation of the disgraceful efforts to confine people to infected places—to virtually say to those who would fly from them, as the surest and most speedy means of escaping the disease, Go back and die! Yet these same communities, who so act through their "health" authorities in some cases, in maintaining their shot-gun quarantines and other prohibitions, habitually indulge fever-nests in their own midst, liable at any time, under propitious weather, to poison the multitude, and at all times susceptible to the true epidemic influences which they fail to recognize.

Surgeon-General Hamilton's Weekly Abstract, September 14th to October 12th, reports its continued prevalence at Tampa, Manatee, Jacksonville, Fernandina, Gainesville, Palmetto, Callahan, and Green Cove Springs, and Decatur, Ala., with little or no abatement. In Jacksonville and Fernandina, at least, the number of cases in proportion to the remaining populations, at the time of this writing, appears to be quite as great as at any time. It will probably so continue until it is suspended by the setting in of winter weather or by the want of new subjects. There have been, in all, nearly 4000 cases, with a mortality of about ten per cent.

At Jackson, Miss., it appears to be effectually arrested.

Dr. John Guiteras, of the Marine Hospital Service, reports as one of the results of his inspections in Florida: "No accurate record of vital statistics is kept in any of the smaller towns, and the information obtained is not very reliable. The undertaker is the only source whence the mortuary tables are to be

obtained." Hence the difficulty of ascertaining how widely extended the disease may be, under the circumstances, is manifest; and the more, when the manner of distributing fomites is taken into consideration, greatly increasing the probability, unfortunately, that the disease has gained a foothold in the State so extensive that it will be exceedingly difficult to get rid of it.

Havana.—Deaths reported from yellow-fever during the two weeks ending September 14th, 29.

The Hendersonville episode is fully reported and remarked upon further on by the Secretary of the State Board of Health of North Carolina.

In order to stimulate ship-masters to aid in securing a clean ocean-going fleet, the following regulation concerning the treatment of foul ships is hereby adopted, and will be observed at all national quarantine stations:

TREASURY DEPARTMENT, U. S. MARINE-HOSPITAL SERVICE, }
Washington, D. C., October 5, 1888. }

To Medical Officers of the Marine Hospital Service, and others whom it may concern:

1. When a vessel arrives at any national quarantine station from an infected port, and requires disinfection, she will be subjected to *ordinary disinfection*, as provided in former regulations.

2. When any vessel shall arrive at a national quarantine station in such foul condition as to render her dangerous from a sanitary point of view, and is found to require cleansing and disinfection, having at any former time within one year been subjected to ordinary disinfection, such vessel will be required to undergo *extraordinary disinfection*, which, in addition to the ordinary measures, will include holy-stoning, scraping, the taking out of rotten wood, a second disinfection, and interior repainting, all of which will be required before granting a certificate of free pratique.

JOHN B. HAMILTON,
Supervising Surgeon-General, M. H. S.

Approved:

HUGH S. THOMPSON,
Acting Secretary.
GROVER CLEVELAND.

ALABAMA.—*Mobile*, 40,000: Reports 79 deaths during August, of which 26 were under five years of age. Annual death-rate, 23.7 per 1000. From zymotic diseases there were 24 deaths, and from consumption, 8.

CALIFORNIA.—The Secretary of the State Board of Health reports the number of deaths during the month of August, 1888, from 51 localities, comprising a population of 722,600, 908, representing an annual death-rate of 15 per 1000. Consumption caused 138 deaths—over one sixth of the total mortality. Zymotic diseases, 141, the chief of which were: Diarrhoeal diseases, 43; diphtheria, 31; typhoid-fever, 27; remittent-fever and typho-malarial-fever, 24.

San Francisco, 300,000: Deaths during the month, 478—from zymotic diseases, 60; consumption, 71; acute lung diseases, 52.

Los Angeles, 80,000: 59; from consumption, 10; zymotic diseases, 14.

Oakland, 50,000: 65; from consumption, 13; acute lung diseases, 4; from zymotic diseases, 14.

San Diego, 30,000: 21; from consumption, 2; from zymotic diseases, 6.

Sacramento, 35,000: 38; from consumption, 5; from zymotic diseases, 10.

CONNECTICUT.—The Secretary of the State Board reports for August, 1888, the total number of deaths returned by 164 towns, comprising a population of 725,826, 1433, representing an annual death-rate of 23.6. Deaths under five years, 652—45.4 per cent.

“Small-pox has occurred in Colchester and Norwalk during the month. Both cases are recovering. The timely and well-directed action of the local health boards has prevented extension of the disease.

“Scarlet-fever was reported in Bridgeport, Enfield, New Haven, Norwalk, and Waterbury. Four deaths.

“Typhoid-fever occurred in Bethel, Bridgeport, Haddam, Hartford, Middletown, New Britain, New Haven, New London, Norwalk, Putnam, Roxbury, Southington, Suffield, Stratford, Waterbury, and Windham. Thirty-two deaths.

"Diphtheria. In Bridgeport, Danbury, Hartford, Manchester, Meriden, New Haven, Portland, Stonington, and Waterbury. Eight deaths."

ILLINOIS.—*Chicago*, 800,000: Reports 1566 deaths during August, of which 921 were under five years of age. Annual death-rate, 22.86 per 1000. From zymotic causes there were 601 deaths, and from consumption, 103.

MARYLAND.—*Baltimore*, 431,879: Reports 893 deaths during the four weeks ending August 25th, of which 464 were under five years of age. Annual death-rate, 26.89 per 1000. From zymotic diseases there were 338 deaths, and from consumption, 88.

MASSACHUSETTS.—*Boston*, 415,000: Reports 988 deaths during August, of which 473 were under five years of age. Annual death-rate, 28.5 per 1000. There were 346 deaths from zymotic diseases, and 117 from consumption.

MICHIGAN.—The Secretary of the State Board reports for the month of August, 1888, compared with the preceding month, that dysentery, diarrhœa, cholera infantum, cholera morbus, remittent-fever, typho-malarial-fever, and erysipelas increased, and that measles decreased in prevalence. That the temperature also, as compared with the preceding month, was lower, the absolute humidity and the day and night ozone were less, and the relative humidity was the same.

Compared with the average for the month of August in the nine years, 1879-87, intermittent-fever, cholera morbus, whooping-cough, remittent-fever, diphtheria, tonsillitis, cholera infantum, typho-malarial-fever, influenza, and diarrhœa were less prevalent in August, 1888. There was no disease reported more than usually prevalent in August, 1888. And the temperature for the month of August, 1888, compared with the average of corresponding months in the nine years, 1879-87, was lower, the absolute humidity slightly less, the relative humidity was the same, and the day and night ozone were much less.

Including reports by regular observers and others, diphtheria was reported present in Michigan in the month of August,

1888, at 27 places, scarlet-fever at 25 places, typhoid-fever at 28 places, and measles at 7 places.

Reports from all sources show diphtheria reported at 6 places more, scarlet-fever at 8 places more, typhoid-fever at 13 places more, and measles at 15 places less in the month of August, 1888, than in the preceding month.

Detroit, 230,000 : Reports 408 deaths for August, of which 259 were under five years of age. Annual death-rate, 20.88 per 1000. From zymotic causes there were 184 deaths, and from consumption, 24.

MINNESOTA.—Infectious diseases reported during the month of August : Diphtheria, 62 cases, 18 deaths ; scarlatina, 14 cases.

Diseases of animals : Cases of *glanders* remaining isolated or not accounted for, 36 ; reported during the month, 10 ; killed, 12 ; released, 5.

St. Paul, 175,000 : Reports for August 243 deaths, of which 181 were under five years of age. Annual death-rate, 16.66 per 1000. From zymotic diseases there were 135 deaths, and from consumption, 15.

MISSOURI.—*St. Louis*, 440,000 : Reports 823 deaths for the month of August, of which 368 were under five years of age. Annual death-rate, 24.0 per 1000. From zymotic diseases there were 221 deaths, and from consumption, 49.

NEW JERSEY.—*Hudson County*, 270,232 : Reports for August 628 deaths, of which 329 were under five years of age. Annual death-rate, 27.9 per 1000. From zymotic diseases there were 208 deaths, and from consumption, 59.

NEW YORK.—Official *Bulletin* of the Secretary of the State Board reports : In 125 cities, villages, and towns, having a population of 3,812,300, the death-rate for the month of August is 20.48 (18.72 in July). The proportion of deaths from zymotic diseases per 1000 deaths from all causes is 345.00 (380 in July and 383.30 in August, 1887). The death-rate from diarrhœal diseases is, however, higher than in the preceding month or in August, 1887, being 246.50 per 1000 total mortality ; this has been partly due to the notable prevalence

of inflammatory diarrhœa and dysentery among adults reported from numerous localities, the infant mortality being lower than in July. Whooping-cough continues to increase in prevalence ; also typhoid-fever, which has, however, a lower death-rate than in August, 1887. Diphtheria is prevalent in some localities, but the general death-rate from it is lower. A case of small-pox has recently (September 19th) developed in East Aurora, one in North Tonawanda, one near Springville, and three in one house near Lawton's Station, in the Cattaraugus Indian Reservation, all near Buffalo ; the local health boards are all alive to the situation. From consumption there were 96.10 deaths per 1000 total mortality, and 187.06 per 1000 deaths above five years of age.

Severally, the populations and death-rates are as follows :

Maritime District.—New York City, 1,526,081, 27.73 ; Brooklyn, 757,755, 26.72 ; Gravesend, 5000, 34.80 ; New Utrecht, 4742, 40.48 ; Long Island City, 21,000, 29.14 ; Newtown, 10,000, 38.40 ; Oyster Bay, 12,000, ? ; Hempstead, 18,000, 13.92 ; North Hempstead, 8000, 21.00 ; Huntington, 8100, 31.11 ; Jamaica, 10,089, 32.75 ; Southold, 7267, 19.82 ; Sag Harbor, 3000, 24.00 ; New Brighton, 15,000, 28.80 ; Edgewater, 12,000, 40.00 ; Northfield, 7014, 34.25 ; Westfield, 7000, 17.14 ; Yonkers, 27,500, 19.29 ; Westchester, 6900, 17.19 ; Port Chester, 4000, 15.00 ; Sing Sing, 6500, 16.62 ; New Rochelle, 5500, 24.00.

Hudson Valley District.—Albany, 98,000, 20.70 ; Cohoes, 20,000, 18.00 ; Troy, 65,000, 36.18 ; West Troy, 13,000, 16.62 ; Hoosick Falls, 6000, 40.00 ; Lansingburg, 10,000, 49.20 ; Green Island, 5000, 31.20 ; Greenbush, 8000, 16.50 ; Coxsackie, 4000, 8.00 ; Catskill, 4500, 10.67 ; Hudson, 10,000, 28.80 ; Kingston, 21,000, 21.15 ; Ellenville, 3000, 32.00 ; Marbletown, 4000, 9.00 ; Esopus, 4736, 12.67 ; Saugerties, 4000, 12.00 ; Poughkeepsie, 20,200, 30.58 ; Fishkill, 10,732, 26.91 ; Wappinger Falls, 5000, 28.50 ; Newburg, 20,000, 30.00 ; Port Jervis, 9500, 24.00 ; Middletown, 10,000, 28.80 ; Goshen, 4387, 30.00 ; Ramapo, 5000, 31.20 ; Haverstraw, 7000, 15.43.

Adirondack and Northern District.—Argyle, 3700, ? ; Salem, 3500, 17.14 ; Fort Ann, 4267, 14.06 ; Fort Edward, 4880, 24.57 ; Glens Falls, 10,000, 10.80 ; Crown Point, 4287, 2.80 ;

Malone, 9000, 29.33; Potsdam, 4000, 27.00; Ogdensburg, 11,000, 40.37; Gouverneur, 5500, 19.64; Plattsburg, 7000, 27.49; Watertown, 12,200, 28.52; Lowville, 3188, 11.25; Clayton, 4314, 19.53; Ellisburgh, 4811, 12.50.

Mohawk Valley District.—Schenectady, 20,000, 24.00; Schoharie, 3350, 10.75; Cobleskill, 3371, ?; Amsterdam, 14,000, 15.60; Johnstown, 6000, 18.00; Gloversville, 10,000, 22.80; Little Falls, 7200, 25.00; Herkimer, 3000, 16.00; Ilion, 4200, 14.29; Utica, 43,000, 23.16; Rome, 12,045, 21.00; Boonville, 4000, 18.00; Camden, 3400, 17.65; Waterford, 5400, 28.88; Ballston Spa, 3200, 18.75; Saratoga Springs, 10,000, 54.00.

Southern Tier District.—Binghamton, 25,000, 23.20; Owego, 6000, 20.00; Candor, 4323, 19.43; Waverly, 3000, ?; Hornellsville, 10,000, 8.40; Elmira, 25,000, 21.60; Horseheads, 3500, 27.42; Bath, 3500, 20.57; Corning, 8000, 34.50; Olean, 8000, 22.75; Salamanca, 6000, 12.00; Jamestown, 14,000, 18.40; Westfield, 3000, 20.00.

East Central District.—Walton, 3540, 13.60; Delhi, 3000, 24.00; Cooperstown, 3000, 8.00; Oneonta, 7000, 20.57; Worcester, 3000, 20.00; Cazenovia, 4363, 13.75; Brookfield, 3685, 6.48; Hamilton, 3912, 16.15; Baldwinsville, 3000, ?; Skaneateles, 4866, 5.00; Syracuse, 80,000, 24.60; Cortland, 9000, 20.22; Homer, 3000, 24.00.

West Central District.—Auburn, 26,000, 21.23; Ithaca, 10,000, 13.20; Groton, 3450, 10.44; Waterloo, 4500, 18.67; Hector, 5000, 9.60; Manchester, 4000, 15.00; Phelps, 7000, 5.14; Canandaigua, 6300, 22.85; Geneva, 6000, 30.00; Penn Yan, 4500, 16.60; Dansville, 3700, 22.70; Batavia, 7000, 8.57; Le Roy, 5000, 14.40.

Lake Ontario and Western District.—Oswego, 24,000, 18.50; Richland, 4000, 12.00; Fulton, 4000, 21.00; Clyde, 3000, 12.00; Lyons, 6000, 26.00; Newark, 3500, 20.57; Palmyra, 4800, 15.00; Rochester, 110,000, 27.27; Brockport, 4500, 10.67; Medina, 4000, 12.00; Albion, 5000, 24.60; Buffalo, 230,000, 32.44; Tonawanda, 4900, 40.80; Amherst, 4578, 18.35; Lockport, 15,000, 10.40.

NORTH CAROLINA.—Official *Bulletin* reports review of *diseases dangerous to the public health* by counties, for August :

Typhoid-fever. There was reported from Alamance, Ashe, Buncombe, Caldwell, Camden, Catawba, Davidson, Forsyth, Franklin, Gaston, Granville, Green, Henderson, Johnston, Lincoln, Macon, Madison, Martin, McDowell, Nash, Person, Richmond, Rowan, Rutherford, Sampson, Stanley, Swain, Union, Vance, Warren, Wataugua—31.

Diphtheria was reported from Beaufort, Caswell, Davidson, Forsyth, Granville, Green, Johnston, McDowell, Person, Transylvania.

Malarial-fever was reported from Alamance, Camden, Caswell, Chatham, Columbus, Cumberland, Duplin, Gaston, Johnston, Martin, Nash, New Hanover, Onslow, Pender, Person, Rowan, and Sampson counties.

Scarlatina was reported from Madison County.

Mumps was reported from Montgomery County.

Whooping-cough was reported from Onslow, Transylvania, and Union counties.

Yellow-fever is reported upon as follows :

“ *Yellow-fever*, one case, a refugee from Jacksonville, sick in the country, was isolated, and recovered, but no other case from it. Henderson County tried the experiment of admitting refugees from Jacksonville, and although there were 10 cases and 2 deaths, it did not spread.

“ *The Refugees from Jacksonville—Hendersonville, Hickory, Waynesville, and Murphy Extend an Invitation.*

“ An experiment of some magnitude has been inaugurated in the State since our last *Bulletin*. Surgeon-General John B. Hamilton, M. H. S., desirous of finding homes of refuge for the citizens of the stricken city of Jacksonville, began his inquiry through the State Board of Health, and otherwise, which was responded to first by Murphy, in Cherokee County, then Hendersonville, Hickory, and Waynesville. Each of these towns was willing to receive a considerable number. Hendersonville naming 500, it was finally concluded to send them there. Accordingly a train was prepared, which ran all the way through from Jacksonville to their place of refuge. The cars employed were old and uncomfortable, and their journey, by reason of delays from obstructions arising from the floods, was wearisome and trying. Dr. Guiteras, an experienced

physician, was in charge of the party. They were paroled, by order of Dr. Hamilton, not to leave Hendersonville under ten days.

"During the journey there was considerable panic, and a mutinous spirit among the refugees. For instance, a rumor of a case of yellow-fever in an adjoining car would cause one coach to quarantine the other, and in this plight they reached their destination.

"It was understood from the telegrams that only such persons would be sent as could support themselves, but instead it was a very mixed crowd, and many dependent persons were sent, unavoidable perhaps in such circumstances. They were distributed through the town in improvised hospitals.

"Unfortunately, the refugees did not all keep their parole, but commenced scattering to different places, four of them having been detected trying to make their escape to Wilmington. The inhabitants of Hendersonville, not counting upon receiving a mass of people without means, found they had a big burden upon them. The surveillance which it was expected would be exercised over them amounted to almost nothing, there being only one policeman in the town, and over 300 refugees.

"The above condensed statement, gathered in part from a gentleman present when the train arrived, and other information, leads to the following reflections and suggestions :

"The experiment as to whether or not yellow-fever will be propagated in the altitude of Hendersonville, we believe will be answered in the negative, but it is worthy of a careful study.

"The influx of a number of persons from a town where pestilence is rife to a town where the population is confident of its harmlessness to them must be viewed in two aspects. 1. The desire to afford refuge as a philanthropic movement, or from the lower sense of profit to the hotels and boarding-houses ; 2. The danger which results from the lack of means to keep so many persons under strict observation and discipline, and prevent them overrunning the cities where their presence is considered a menace. For instance, in the case of these refugees nothing prevented them but their parole from going to the sea-coast towns in the Carolinas and Virginia, and their parole they did not all keep.

“ The writer believes that this experiment is a dangerous one, and should not be undertaken again, except under more specific restrictions. If such a number of refugees come from one State into another, they should only be permitted to go into a regular quarantine camp. Their maintenance should be provided for by means furnished by the corporation from which they come ; certainly it should not fall upon the inhabitants of the town of refuge.

“ Dr. L. L. Johnson, Superintendent of Health of Henderson County, reports as follows :

“ ‘ HENDERSONVILLE, N. C., September 9, 1888.

“ ‘ Two hundred and sixty refugees came to Hendersonville from Jacksonville, Fla. Of that number ten had yellow-fever, two died, and all the rest recovered. Our people were very much dissatisfied in regard to their coming, but have become reconciled. After ten days, they have been allowed to go to any point they desired.’

“ The fever did not attack any one outside the ranks of the refugees.

“ The North Carolina Board of Health have decided that they will discountenance the colonization of refugees from the yellow-fever districts, unless they can have assurance that they can be faithfully quarantined and cared for in a sanitary camp. The governor has been informed of this determination on the part of the board.”

OHIO.—*Cincinnati*, 325,000 : Reports for August 589 deaths, of which 297 were under five years of age. Annual death-rate, 21.75 per 1000. From zymotic causes there were 183 deaths, and from consumption, 55.

PENNSYLVANIA.—*Philadelphia*, 1,016,758 : Reports for four weeks ending August 25th, 1872 deaths, of which 892 were under five years of age. Annual death-rate per 1000, 24.06. From zymotic causes there were 523 deaths, and from consumption, 177.

Pittsburgh, 230,000 : Reports for four weeks ending August 25th, 406 deaths, of which 233 were under five years of age. Annual rate of mortality, 22.8 per 1000. From zymotic diseases there were 53 deaths, and from consumption, 30.

TENNESSEE.—(*Bulletin* not received.) *Memphis* official report for the month of August (65,000—white, 44,334 ; 21,666 colored). Total number of deaths, 75 white, 97 colored—172 ; under five years of age, 28 white, 47 colored. From zymotic diseases, 18 white, 32 colored.

WISCONSIN.—*Milwaukee*, 195,000 : Reports for the month of August 398 deaths, of which 163 were under five years of age. Annual death-rate per 1000, 24.0. From zymotic diseases there were 179 deaths, and from consumption, 21.

Small-pox.—Deaths from this disease abroad, by latest reports received, as follows : During the month of August : Manchester, 3 ; Sheffield, 1 ; Hull, 1 ; Paris, 7 ; Havre, 1 ; Nancy, 1 ; St. Étienne, 2 ; Amiens, 7 ; Lyons, 1 ; Charleroi, 5 ; Boom, 1 ; Quaregnon, 3 ; Jemappes, 1 ; Vienna, 3 ; Pesth, 1 ; Prague, 33 ; Trieste, 13 ; Warsaw, 20 ; Bucharest, 5 ; Cairo, 2. During the month of July : Marseilles, 9. During the month of June : Lille, 2 ; Moscow, 4 ; Milan, 41 ; Genoa, 4 ; Bologna, 4 ; Madrid, 6 ; Algiers, 1 ; Buenos Ayres, 75.

Vaccination's power of protection against small-pox is effectually shown by the recently published statistics of the German Empire, in which the practice of vaccination and re-vaccination is compulsory. For the year 1886 the small-pox death-rate for the whole empire was only .03 to each 100,000 of the population. In the larger cities it ranged from .07 in Berlin to 3.6 in Hamburg. Compared with the German cities, the rates in other European cities, where the practice is not compulsory, the death-rates from small-pox ranged from .06 in London to 4.9 in Liverpool ; Paris, 9.0 ; Brussels, 11.4 ; St. Petersburg, 15.3 ; Moscow, 34.1 ; Vienna, 26.2 ; Venice, 51.6 ; Rome, 134.3 ; Genoa, 153.8 ; Pesth, 368.7 ; Marseilles, 545.3 to the 100,000 of population. More than two thirds of the deaths from small-pox in Germany were in cities like Hamburg, which have a large foreign shipping trade, and in those districts which lie immediately along the Russian and Austrian borders.

Whooping-cough.—Extraordinary mortality. *El Siglo Medico* states that the mortality from whooping-cough in Austria-

Hungary and Germany, in 1883, according to official reports, was 23,976, and Herr Hagenbach gives the average number of cases of whooping-cough in children, in Germany, every year, as 25,000, and estimates the mortality at 76 per cent.

DISCOURAGING STATISTICS.—The *Journal d'Hygiène* credits *L'Avenir Militaire* with the following lamentable statement of the losses in the French army in Tonquin since 1885—that is, during the period of pacification, or, as we would call it, the period of reconstruction :

“ The statistics of deaths during the conquest either do not exist at all or are kept secret.

“ Our true enemy in that country is not the Anamite—the Black Flag—but the climate, and the only way to combat it is to put our soldiers in such hygienic conditions as to enable them to withstand it. Much has already been done in regard to food and clothing. The authorities have been made to understand that the care necessary at Ha-Noi is very different from that given in Paris. The daily fare has been improved ; strong liquors of poor quality have been forbidden ; but these praiseworthy efforts are rendered ineffectual by the deplorable conditions under which the men are quartered. The greater number lie on the damp ground on beds which protect them from neither sun nor rain.

“ The consequence has been that the deaths from the enemy in the field have been comparatively insignificant when compared with the mortality from cholera and other diseases of malarial origin. Thus in 1885, of 3778 deaths, 2969 were from sickness, and only 800 from the accidents of war.

“ Of 16,891 men who entered the hospital, 15,559 were for various diseases incidental to the climate, and 1332 only for wounds.

“ During the period from 1885 to the second quarter of 1887—twenty-seven months—the whole loss was 27,845 men, divided as follows : Total number of deaths, 5700 ; soldiers rendered unfit for service by sickness, as chronic dysentery, diseases of the liver, etc., 20,145. Here is, then, the result of our territorial policy stated in the clearest terms possible :

“ One thousand men a month have been secretly swallowed up in a foreign land.”

This policy is not new. It has been constantly enacted by the self-styled enlightened nations for the last three hundred years, and millions of lives have been sacrificed to satisfy the greed for gold, the avaricious desire for increase of territory which did not belong to the claimant.

WHOLESOME WATER is a reliable therapeutic agent. The recent investigation of the water furnished the city of Indianapolis, says the *Indiana Med. Journal*, seems to have demonstrated that it answered for both food and drink, when the water from our modern Ganges was pumped into the city mains. Ignorance had covered a multitude of sins, and the people drank it without hesitation. One is reminded of the witticism of Josh Billings, who said: "I like to eat mince pie, because I then know what I am eating."

"THE NEED OF PURE DRINKING-WATER IN NEW ORLEANS (and other places) has long been felt. In private residences people who consume cistern water frequently delude themselves with the belief that they have the purest of beverages. Let them but once in a while have the deposit at the bottom of the cistern pumped out and the cistern cleaned, and they will begin to wonder at their illusion. This water, laden with the washings from the roof, composed of dust and pulverized manure from the streets, is compared with Mississippi water and imbibed by thousands in preference to this muddy alternative. It must be confessed that our river water is not pleasing either to sight or taste. It is healthy, however, and when deprived of its sediment one of the best of drinking waters. Professor Ordway, of the Tulane University, in an admirable paper read before the New Orleans Academy of Sciences, has this to say, after a careful study of specimens of our river water: 'The water after (standing) many weeks is still opaline. It contains bicarbonates of calcium and sodium, and probably by reason of its alkaline character it keeps suspended a minute amount of hydrated silica. If we neutralize the alkali the effect seems almost magical. The fine matter immediately coagulates and becomes flocculent, and it settles completely in a few hours. It is well known that alum and perchloride of iron are very efficient in this way. In making

trials with various proportions we found the best results were obtained by using at the rate of one pound of perchloride of iron to one thousand gallons of water. After such an addition the water may be filtered with great ease and the filtrate contains no iron ; or if the coagulated liquid is allowed to stand twenty-four hours it becomes perfectly clean. There are other means of producing a rapid deposition, but no other substance seems to possess the advantages of the perchloride. It is absolutely harmless, for it leaves nothing in the water except chloride of sodium in the place of the carbonate, and water containing a trace of salt is better for domestic uses than pure water. Perchloride of iron can be made on a large scale at a low cost. Having manufactured muriatic acid for many years I feel warranted in saying that it can be made here for less than two cents per pound, and the other material, hemitate iron ore, is abundant enough. Were our waterworks company to establish chemical works for the manufacture of the perchloride they could afford to furnish us perfectly clear water at a very slight advance on present prices. Indeed, with the increased consumption which would naturally ensue on providing a clear and pure water, they should make profit enough without any increase in the price.'"—*New Orleans Medical and Surgical Journal*.

THE "DAMNATORY" EFFECT OF ARTIFICIAL TEETH.—A correspondent favors us with the subjoined cutting, which exemplifies that the uses of artificial teeth have a more serious and doctrinal influence, than one at the first blush might suppose. A young country dentist recently had recommended to him as a patient the bishop of his diocese. His first commission was for a complete set of teeth, and a day was appointed for the prelate to call and fit them in. It was a moment of anxiety—and, indeed, professional importance—to the dentist, as he watched his lordship examining himself and his new teeth in the mirror. Imagine his horror, therefore, when he distinctly caught an expression of a damnatory character ending in "ation," from his client's lips. "I dare say they are a little uncomfortable, my lord," he murmured conciliatingly, "just at first and until you get used to them." "Without doubt you shall perish everlastingly," exclaimed

the bishop with vehemence. "But, indeed, my lord, if you will have patience," pleaded the dentist, "in a week's time—" "What do you mean?" inquired the prelate, turning round with an apostolic smile. "Why should I not have patience? The teeth fit me beautifully. It is the first time I have found myself able to pronounce the Athanasian Creed with distinctiveness for twenty years."—*British Journal of Dental Science*.

SOLIDIFIED PETROLEUM FUEL.—According to the *Revue Scientifique*, the problem of reducing petroleum to a solid state, available for practical purposes, has been solved by Dr. Kauffman, who has followed up the experiments made in the United States with the admixing of soap. He heated the liquid, to which from one to three per cent of common soap had been added, half an hour, until the soap was completely dissolved, when the mixture acquired the consistency of tallow. The article thus obtained may be cut into pieces of suitable size for feeding to furnaces. Solidified petroleum, although it does not kindle readily, burns slowly and steadily and without smoke. The residual ash amounts to only two per cent. The combustion is only one third as rapid as that of an equivalent of anthracite coal, while the amount of heat evolved is more intense.

WONDERFUL DISCOVERY IN GLASS—THE FUTURE OF THE MICROSCOPE.—*Ironmongery* of April 30th says :

"Perhaps the most remarkable recent discovery is the new glass which has just been made in Sweden. At present common glass contains only six substances, while the new Swedish glass consists of fourteen, the most important elements being phosphorus and boron, which are not found in any other glass. The revolution which this new refractor is destined to make is almost inconceivable if it is true, as stated, that while the highest power of the present microscopic lens reveals only the one four-hundred-thousandth part of an inch, this new glass will enable us to distinguish one two-hundred-and-four-million-seven-hundred-thousandth part of an inch. What are we coming to? Is it going to be possible to see into the human frame through the pores of the skin?"

THE AMERICAN PUBLIC HEALTH ASSOCIATION will convene at Milwaukee, Wis., Tuesday, November 20th, 1888, at

10 o'clock A.M., and continue four days. The meetings will be held in the Atheneum Hall.

The Executive Committee have selected the following topics for consideration at said meeting : I. The Pollution of Water-Supplies ; II. The Disposal of Refuse Matter of Cities ; III. Animal Diseases Dangerous to Man ; IV. Maritime Quarantine, and Regulations for the Control of Contagious and Infectious Diseases, and their Mutual Relations.

Precedence will be given papers upon the above subjects, although other papers of a sanitary nature will be received by the committee. Papers of ability and practical application upon any subject connected with the public health interests will be received.

The following partial list of papers is announced. The full list will appear in the daily programmes of the meeting :

The President's Address.

"The History and Administration of Quarantine in Texas, 1878 to 1888."—By R. Rutherford, M.D., State Health Officer of Texas.

"The Canadian System of Maritime Sanitation."—By F. Montizambert, M.D., Quarantine Officer at Grosse Isle, St. Lawrence River.

"Yellow-Fever : Panics, and Useless Quarantines—its Limitation by Temperature."—By John H. Rauch, M.D., Secretary of the State Board of Health of Illinois.

"The Organization of the National Health Service."—By Henry P. Walcott, M.D., President State Board of Health of Massachusetts.

"State Boards of Health."—By Ezra M. Hunt, M.D., Secretary State Board of Health of New Jersey.

"The Difficulties and Success of the Public Health Service in Large Cities."—By Oscar C. de Wolf, M.D., Health Commissioner of Chicago.

"Ontario Sanitary Legislation, its Strength and its Weakness."—By John Coventry, M.D., Medical Health Officer of Windsor, Ontario, Canada.

"The Destruction of Organic Matter by Fire as a Sanitary Measure—Garbage Furnaces."—By S. S. Kilvington, M.D., President of the Board of Health of Minneapolis.

"Vaccination as a Protection from the Infection of Small-

pox."—By D. W. Hand, M.D., President of the State Board of Health of Minnesota.

"Tuberculosis, its Origin, Detection, and Control."—By D. E. Salmon, D.V.M., Chief of the Bureau of Animal Industry, Washington.

"Veterinary Sanitary Work in Wisconsin, with Special Reference to Diseases Communicable to Man."—By V. T. Atkinson, D.V.M., State Veterinarian of Wisconsin.

"The Relations of Bacteriology to the Discovery and Prevention of Causes of Infectious Diseases among Men and Animals."—By Theobald Smith, M.D., of the Bacteriological Laboratory of the Bureau of Animal Industry, Washington.

"Popular and Scholastic Education in Hygiene."—By J. T. Reeve, M.D., Secretary State Board of Health of Wisconsin.

"Remarks on the Classification of Diseases."—By Henry B. Baker, M.D., Secretary of the Michigan State Board of Health.

"Meteorological Observations as Respects Disease Prevalence."—By Professor Payne, Director of Observatory, Northfield, Minn.

"Some Observations on Yellow-fever and its Habitudes as Opposed to the Fallacies and Dangers of Personal Quarantine."—By A. N. Bell, M.D., Brooklyn, N. Y.

Valuable reports have been promised from several of the committees.

Arrangements have been made for the use of the stereopticon by any who desire to avail themselves of it in illustrating papers presented, as has already been announced by circular from the president's office.

The report of the committee on the Lomb Prize Essays will be an event of much interest, as some sixty essays have been received in competition for the prizes offered by Mr. Henry Lomb, of Rochester, N. Y.

The headquarters of the officers and committees will be at the Plankinton House.

The Committee of Arrangements will mail to the members of the Association a circular, giving information regarding reduced railroad fares, hotel rates, etc. ; others will be sent a

copy upon application to the chairman of that committee, R. Martin, M.D., Milwaukee, Wis.

The hotel rates will be as follows : Plankinton House (headquarters of the officers and committees), \$3 to \$5 per day ; Republican House, \$2 to \$3 a day ; Kirby House, \$2 per day ; Windsor Hotel, \$2 to \$2.50 per day ; Grand Avenue Hotel, \$2 per day ; St. Charles Hotel, \$2 per day.

After November 12th all communications to the Secretary should be sent to Milwaukee, Wis., care of Dr. R. Martin.

IRVING A. WATSON, *Secretary.*

Concord, N. H.

THE OHIO STATE SANITARY ASSOCIATION.—The Sixth Annual Meeting will be held in Canton, O., November 14th and 15th, 1888.

The first session in the *Assembly Chamber of the City Hall*, at 10 o'clock, on the morning of the 14th.

Many papers on subjects of the first importance are promised, and all persons interested in Public Health and their own welfare are cordially invited to attend the sessions.

R. HARVEY REED, M.D., *Secretary.*

Mansfield, O.

THE CONGRESS OF AMERICAN PHYSICIANS AND SURGEONS, "composed of National Associations for the promotion of Medical and Allied Sciences," which held its first triennial meeting in Washington, D. C., September 18th–20th, 1888, appears to have been eminently successful in so far as it evidently promoted scientific work in the several associations of which the Congress was composed ; but as an offset to the International Medical Congress of 1887, as intended by its originators, it was a conspicuous failure.

The result, however, is in the highest degree favorable to the creation and promotion of the declared purpose of the Congress, as above quoted, by the infusion of a spirit of rivalry among the several associations of which it is composed, in anticipation of the joint meetings, triennially, to give an account of themselves on a much more conspicuous platform than their annual meetings, severally, have been able to give hitherto.

Without exception, each one of the baker's dozen present gave a good account of itself, in the number and excellence of the papers presented and subjects discussed, and THE SANITARIAN would, if space permitted, endeavor, by abstract, to show the several excellencies.

The American Climatological Association, with which THE SANITARIAN is more particularly allied, was second to none in the importance and application of the subjects presented, of which it is purposed to give a full abstract hereafter—finding room in this issue for the excellent paper of Dr. Roosa only, to which attention is particularly invited.

THE FABLE OF THE FLY ON THE HUB OF THE WHEEL is so admirably illustrated by the leading editorial in the *Sanitary Plumber* of September 25th, that we here reproduce it, with interlineations and remarks which may be read apart, as follows :

It is not true that, "of all of the professions or scientific callings, none are so open to the attacks of scepticism or the shafts of ridicule as the medical, and what we may term the sanitarian profession. It seems as if it were impossible for the learned doctors to establish a medical proposition or lay down a hygienic law," *understandable by plumbers*, "but it is" *not* "shown to be disproved by data, facts, and figures. It is" *not* "a well-known historical fact that a thorough series of experiments in the London Hospital demonstrated that the patients in one certain ward, who received no medicines whatever, recovered in a much larger proportion than those who were 'doctored.'" *It is not true that* "none of the pet theories and laws of health which have been upheld as axioms conducive to longevity can be proven. Even the golden rule that 'cleanliness is next to godliness' is" *not* "now a shattered idol. In spite of all that has been preached about the healthfulness of cleanliness, the fact stands out as clearly as the noonday sun, or the nose on a man's face, or anything else that has contracted the habit of exterior perpendicularity, that the dirtiest people on the globe are" *not* "the healthiest. Take the Indians, the Bedouins, the Arabs, the Esquimaux, for instance, of peoples and races who never wash any part but the two ends of their persons, feet and face, and even

these at rare intervals, as examples" of the *shortest lived people on the face of the earth*. "They don't die early, as a rule, nor are they, in their native state, often afflicted with epidemics," according to *plumbers' statistics*, though notoriously so according to knowledge. "It is after the civilizing influences of religion and rum, soap and insect-searching combs reach the wholly savage and semi-civilized man that he takes to dying early as an individual, after the manner of his" *un-*"cleanly instructors, or by wholesale when the cholera or other epidemic comes, as his civilized brother with the bath-tub," constructed on *plumbers' plans*, without supervision, "does."

"The sanitary cranks and Windgates may collate their statistics and blather about the large mortality in certain districts where stagnant pools and filthy streets invite disease. It is nothing but" *an aggravation of the same causes* by "the crowded population of the teeming tenements which swells the list of victims. It has been well said," *by the ignorant and superstitious*, "that when Death orders a pale-horse cavalry raid through a city, sanitary precautions, rotting offal and decaying vegetation are ignored alike. It comes like the culminating blow upon the Egyptians, and decimates the houses in proportion to their population" and *filthy conditions*, "and is no respecter of persons or hygienic laws" *without practical sanitation*. "More people die in crowded districts simply because there are more of them there to die, but the cause, and, as a consequence, the cure, remains as great a mystery" *to the ignorant* "as ever," *so long as preventive measures are not exercised*.

"Epidemics have been stayed, cities have been quarantined, and disease has been restricted to certain bounds, by a plan of isolation or non-intercourse. But so far as hygiene, sanitation, and medical science is concerned, there is not a plumber in the land who has not more to do with the health and longevity of his patrons than the corps of quacks and cranks combined," and *the more is the pity*, "and according to our way of thinking it does no harm to make the craft realize the importance of their calling, and to advise them not to be sat down upon nor dictated to by blatherskites who have had no" *more* "practical experience" *than plumbers in promoting disease, but to profit by the lessons of practical sanitation everywhere*.

Plumbers should have long since learned that the respective spheres of work of themselves and sanitarians, are widely different ; that, in so far as the accomplished plumber would deem it a conceit for a sanitarian to assume knowledge superior to his, in the construction and practical efficiency of a complicated system of house drainage, thoroughly ventilated and yet protected against siphonage and its consequent dangers, so in like manner the sanitarian, if he is accomplished, as he should be—possessed of a thorough knowledge of disease forces, the habits and habitats, the viability, portability, and longevity of these forces, and the conditions and circumstances promotive of their dissemination or destruction—is, and ought to be, jealous of all means to ends which set physical laws at defiance and challenge the results of scientific observation. Plumbers, architects, engineers, physicians, and sanitarians, are all coefficients to the successful results of preventive medicine ; and stolid, indeed, must be the votary of any one of these callings who is incapable of appreciating the results of such joint action, or who is unwilling to apply knowledge because it is not of his own cult.

THE HOAGLAND LABORATORY is completed and equipped for practical work. President Hoagland, of the new laboratory, has issued the following circular :

THE HOAGLAND LABORATORY, }
Henry St., Cor. Pacific, Brooklyn, October 1, 1888. }

The trustees of the Hoagland Laboratory take pleasure in announcing to the medical profession of Brooklyn the completion of the laboratory and its equipment for practical work. Special facilities are offered to those who desire to prosecute original research. For this purpose private laboratories have been provided and arrangements are now being made for the purchase of a library which shall contain all the literature necessary for reference in the departments of bacteriology, physiology, and pathology. Owing to the absence in the South of Dr. George M. Sternberg, the director, in the further prosecution of his investigation into the cause of yellow-fever, under orders from the President of the United States, the course of lectures on bacteriology, already announced, will be postponed until his return. The trustees further announce

that the services of George T. Kemp, Ph.D., Johns Hopkins University, have been obtained as associate in bacteriology and physiology, and that, with his assistance and under the direction of Dr. Sternberg, practical instruction in bacteriology will be given during the winter and spring. Inasmuch as Dr. Kemp will be at the laboratory daily from 9 A.M. until 5 P.M., this instruction may be taken at any time during these hours. The fee for this course of instruction has been placed at fifteen dollars, which will entitle the subscriber to prosecute his studies until June 1st, 1889, during as many hours of the day as he may desire. Applications for subscription to this course may be directed to J. H. Raymond, M.D., Secretary.

LITERARY NOTICES.

INDEX CATALOGUE OF THE LIBRARY OF THE SURGEON-GENERAL'S OFFICE. Edited by JOHN S. BILLINGS, Surgeon, U.S.A. VOL. IX., pp. 1054. Washington, Government Print. This volume maintains the high standard of painstaking completeness which has characterized the work from the outset. It includes titles from Medicine (popular) to Nywelt. The whole number of authorities is 13,151, representing 6834 volumes and 12,818 pamphlets. It also includes 9999 subject-titles of separate books and pamphlets, and 29,120 titles of articles in periodicals: a sufficient indication of the mine of wealth of which the library of the surgeon-general's office consists opened up to the medical profession throughout the United States by means of this incomparable Index Catalogue.

THERAPEUTICS: ITS PRINCIPLES AND PRACTICE. By H. C. WOOD, M.D., LL.D., Professor of Materia Medica and Therapeutics, and Clinical Professor of the Diseases of the Nervous System, in the University of Pennsylvania.

A Work of Medical Agencies, Drugs, and Poisons, with especial reference to the Relations between Physiology and Clinical Medicine.

The *Seventh* Edition of A Treatise on Therapeutics, Rearranged, Rewritten, and Enlarged. 8vo, pp. 908. Price, \$6. Philadelphia: J. B. Lippincott Company.

That this work should have reached its seventh edition in thirteen years, is a significant comment on its superior excellence. While it may be said of the author, few men have enjoyed better opportunities for thorough cultivation in this branch of medical science, it may be said with equal truth, fewer still have made so good use of them. The work has been a favorite from the outset, notwithstanding many competitors in the same field ; yet the author has shown no disposition to rest upon his laurels. On the contrary, his efforts have evidently been stimulated by success, for he informs us that, during the three years since the issue of the sixth edition, " the preparation of the present volume has necessitated a careful study by its author of nearly six hundred memoirs. . . . The portion of the work devoted to the study of drugs has been entirely rearranged in accordance with a new classification . . . more simple than the one previously employed. All the new drugs . . . have been carefully considered, while many articles upon older drugs . . . have been completely rewritten. . . . Thus, notwithstanding the constant effort at condensation, nearly two hundred pages of new matter have been added to the book."

Primarily, Part I. comprises nearly one hundred pages devoted to the consideration of remedial measures other than drugs : Massage, diet, artificial foods, metallo-therapy ; the treatment of systemic states—exhaustion and neurasthemic, corpulence and lithiasis ; caloric—cold as a tonic and stimulant, and in pyrexia ; electricity in all its therapeutical relations.

Part II. : Drugs, reclassified, is remarkable for its completeness, and for particularity in all doubtful questions of therapeutic values. Confident in the strength of his convictions, the author is careful not to weary the reader with unnecessary detail of the facts upon which they are based, but to give his conclusions authoritatively at whatever risk of conflict with other authors who differ with him. But careful study—and the work throughout merits study on account of its large proportion of original work as compared with other works on the same subject—generally results in carrying the conviction of doubtful readers with the author, because his conclusions are in the main fortified by the best evidence. As a whole, for

both practitioner and student, it is in our judgment the best work in the English language upon the subject of which it treats.

A MANUAL OF MEDICAL JURISPRUDENCE, WITH SPECIAL REFERENCE TO DISEASES AND INJURIES OF THE NERVOUS SYSTEM. By ALLAN McLANE HAMILTON, M.D., one of the consulting physicians to the insane asylums of New York City, etc. Second edition revised. 8vo, pp. 380. Illustrated. Price, \$2.75. New York: E. B. Treat.

This is a practical work of great utility, concisely comprehending pretty much everything of importance on the subject of which it treats, devoid of all unnecessary details. The leading chapters embrace Insanity in its Medico-legal Relations; Hysteroid Condition and Feigned Disease; Epilepsy; Alcoholism; Suicide; Cranial Injuries and Spinal Injuries. A large number of illustrative cases are given of special value to lawyers who would cram themselves on the vexed questions of mental deflections or challenge the results of surgical practice in the interest of clients who would pay their surgeons with damages for unavoidable deformities; yet the work is equally valuable to the medical student and surgeon who would fortify themselves against the insidious wiles of lawyers who hold themselves in readiness to challenge any results for a division of the spoils.

The work is the more valuable, however, from having been written with special reference to the diseases and injuries of the nervous system, upon which Dr. Hamilton is an accepted authority, and the clearness with which he treats feigned diseases, emotional insanity, concussion of the spine, and kindred questions, doubtless will, as it ought to, commend his work to every medical practitioner.

UNITED STATES DISPENSATORY—A New Edition. J. B. Lippincott Company, Philadelphia, announce a new edition of the *United States Dispensatory*. The revision has been thorough, and not merely the addition of a supplement. More than one third of the book, or nearly eight hundred pages, is entirely new matter, while the whole work has been most carefully rewritten. The National Formulary has been incorporated.

"THE PROLONGATION OF HUMAN LIFE" will be treated in an article by C. M. HAMMOND in the *Popular Science Monthly* for November. Mr. Hammond has collected a large amount of information which shows what have been the habits, occupations, diet, and physique of over thirty-five hundred persons who have reached advanced age.

THE AMERICAN COMMON SCHOOL has developed with the growth of the nation. It is no longer local, provincial, sectarian, associated with a certain form of loving, although rigorous piety. It has become national—the nursery of American youth, not the foreign offshoot, with its atmosphere of English Puritanism. It is not Christian, or Jewish, or Agnostic—it is not Irish, or German, or Russian. But it is American, and must be maintained as American. Whatever tends to produce the perfect American citizen, helpful, sound, sober, honest, earnest, patriotic, intelligent, must find place in its curriculum, whether older text-books rise or fall. That is the aim forever to be held in view. That is the grim essential which must not be exchanged for glittering accidentals.—*Rev. A. S. Isaacs, in the October Forum.*

REPORTS OF THE HOME FOR SICK CHILDREN, Cincinnati, O., October 1st, 1883–October 1st, 1887. This is the first medical report of the "Home" since it was established. It discusses the special advantages and exhibits a successful example of such homes which should commend them to other cities. "Children are admitted from birth to the completion of the twelfth year." There are as yet, however, no wards for the treatment of contagious diseases, hence patients so affected are excluded. Notwithstanding, it has twice been necessary to close the doors on account of house epidemics; but by the addition of a new ward last summer provision is made in the event of a new house epidemic. Seven hundred and fifty-nine patients have been admitted during the period. The most fatal diseases and the number of deaths, in the order of their greater prevalence, were as follows: Syphilis, 15; malnutrition, 14; pneumonia, 12; gastro-intestinal catarrh, 10; meningitis, 9; tuberculosis, 9; "cat. large intestine," 6; hydrocephalus, 5. Of surgical cases, 5. Total deaths, 109. Average percentage of mortality for the whole period, 14.86.

"THE ULTIMATE OF SANITATION" is a *brochure* of ten pages made up of extracts from THE SANITARIAN chiefly, with illustrations, urging the importance and practicability of cremating excrementitious matters instead of storing in the soil about our dwellings or polluting the water-courses with them. Chicago, Ill.: Fuller & Warren Co., 56 Lake St.

FOOD LAWS, by HENRY LEFFMAN, M.D., the subject of a brief paper recently read before the Medical Jurisprudence Society, of Philadelphia, published by the society, is well worthy the widest distribution, presenting, as it does, the necessity of more stringent laws against the adulteration of food in a great variety of ways, but little respected by consumers.

ERGOT: A *résumé* of its uses and dangers in obstetrics, by JOEL W. HYDE, M.D., reprint from the Brooklyn *Medical Journal* of a paper read before the Kings County Medical Society recently, is a useful practical paper on a subject with which all physicians should be familiar.

SEVENTH ANNUAL REPORT OF THE MANAGERS OF THE BUFFALO STATE ASYLUM FOR INSANE, 1887, gives the detail of 716 patients, of whom 398 were in the asylum at the beginning of and 318 admitted during the year. Of these 44 died and 316 were discharged. Of the discharged: Recovered, 107; much improved, 34; improved, 66; unimproved, 92; inebriates, 14; not insane, 3.

Ratio of recoveries to number of admissions, 33.65.

Ratio of recoveries to average population, 28.30.

Ratio of recoveries to number of discharged, 29.72.

Ratio of recoveries to number of discharged, exclusive of deaths of inebriates and not insane, 35.78.

Assigned causes in the 380 cases admitted during the year, in the order of their greater prevalence, were as follows: Ill-health from grief and anxiety, overwork, or loss of sleep, 77; general ill-health, 31; intemperance, 31; syphilis, 16; epilepsy, 16; inebriates, 14; senility, 12; paresis, 11; puerperal, 9; change of life, 9; morphia habit, 7; vicious habits and indulgences, 6; ill health following fever, 6; congenital de-

fect, 6 ; ill-health from prolonged lactation, 5 ; ill-health from menstrual irregularities, 5 ; apoplexy, 4 ; various causes, 1 to 3.

EXCESSIVE VENERY, MASTURBATION, AND CONTINENCE : their Etiology, Pathology, and Treatment, including Diseases resulting therefrom. By JOSEPH W. HOWE, M.D., late Professor of Clinical Surgery in Bellevue Hospital Medical College, Fellow of the New York Academy of Medicine, Visiting Surgeon to Charity and St. Francis Hospitals. Second edition revised. Pp. 300. Price, \$2.75. New York : E. B. Treat, Publisher, 771 Broadway.

This volume contains, besides the author's experience in hospital and private practice, the substance of a course of lectures delivered in the Medical Department of the University of New York, on the results of Excessive Venery, Masturbation, and Continence, and the approved methods of treatment by the best authorities everywhere. Indeed, the author shows a remarkable mastery of the subjects treated of, and no medical work we have ever read better fulfils all the conditions of a thoroughly practical book of reference for the busy practitioner or the diligent student who would alike be fortified against the deceptions in the symptomatology of a variety of bodily and mental disorders, inexplicable except by the possession of such knowledge as it is the object of this work to reveal, and which it *does* reveal more completely than any other work with which we are acquainted.

ONE HUNDRED AND TEN LAPAROTOMIES FOR THE REMOVAL OF THE UTERINE APPENDAGES and A YEAR'S WORK IN ABDOMINAL SURGERY are the respective titles of two pamphlet reprints of recent contributions to medical periodicals by W. GILL WYLIE, M.D., New York, showing skilful surgery of practical importance to all gynæcologists.

INFANT FEEDING, ESPECIALLY WITH REFERENCE TO SUBJECTS WITH INFANTILE ECZEMA and CLINICAL NOTES ON PRURITUS are the respective titles of two pamphlet reprints of recent contributions to medical periodicals by L. DUNCAN BULKLEY, A.M., M.D., on subjects of much practical importance.

DR. DETTWEILER'S METHOD OF TREATING PULMONARY CONSUMPTION : An Appeal for the Establishment of an Institution for the Rational Treatment of Pulmonary Consumption, by PAUL H. KRETZSCHMAR, M.D., Brooklyn, reprint of a paper recently read before the Section in Materia Medica and Therapeutics of the New York Academy of Medicine, setting forth the special benefits of out-door—pure air—treatment, to the exclusion of medicine, is worthy of the widest possible distribution among the people generally, as well as physicians.

THIRTY-FIFTH ANNUAL REPORT OF THE PENNSYLVANIA TRAINING SCHOOL FOR FEEBLE-MINDED CHILDREN, Elwin, Delaware County. This is one of the noblest charities of the State, and it is touching to the tenderest of human sympathies to read the statement that during the year no less than seventy applications for epileptics—many of them improvable cases—had to be rejected for the want of accommodations for this unfortunate class. There were received during the year 131, increasing the enrolment in the institution to 655. It is gratifying to notice that plans and means are in contemplation for the needful enlargement of the institution, with special provision for epileptics. For full particulars as to the objects of the institution, the conditions of admittance, terms, etc., communications should be addressed : Isaac N. Keslin, M.D., Elwin, Delaware, County, Pa.

TWENTY-SEVENTH ANNUAL REPORT OF THE CINCINNATI HOSPITAL, 1887, H. M. Jones, Superintendent, continues to illustrate in high degree the advantages of a comprehensive scope in hospital appointments. " Strangers or other persons of means, overtaken by illness, and wishing to avail themselves of the best appointments for proper care, can here find refuge without the sacrifice of any of their liberties. They cannot only obtain appropriate private rooms and trained nurses, but they can choose their own medical attendants, without being restricted to the medical staff of the hospital. This, to many persons, is an estimable privilege ; for, however well chosen the staff of a hospital may be, and distinguished, as the visiting physicians and surgeons of most of our hospitals usually are, for superior skill, notwithstanding many persons so much

prefer choosing for themselves as to make the denial of this privilege an insuperable objection to hospital patronage. . . .

"The Branch Hospital, for contagious diseases, is located one mile west of the city limits, and most desirably situated on a high plateau, with perfect natural drainage, and every natural advantage of a healthful location. The premises include fifty-three acres of land, with abundance of fruit and shade-trees. The large amount of land belonging to the hospital perfectly isolates the buildings from all surrounding premises."

Abstract of summary for the year :

Remaining December 31st, 1886.....	309
Admitted during 1887.....	4,321
Births.....	224
<hr/>	
Total treated.....	4,854

Of these 200 were private patients.

Number treated in public department, 4,272.

THE THREE CODES is a reprint of the Code of Ethics of the American Medical Association, with its Constitution, By-Laws, and Ordinances, brought down to 1888 ; the Code of Ethics of the American Institute of Homœopathy, and the Code of Ethics of the National Eclectic Medical Society. Price, 50 cents. Detroit : Illustrated Journal Co.

THE EXTRACTION OF CATARACT as Influenced by Mycological Development; and THE PULLEY METHOD OF ADVANCING THE RECTUS : two recent papers, reprinted, by A. E. PRINCE, M.D., Jacksonville, Ill.

CLUB FOOT, A RECTAL OBTURATOR, and PALATOPLASTY are the titles of three recent papers, reprinted and stitched together with a reprint of AN AEPTIC ATMOSPHERE (before noticed), by DAVID PRINCE, M.D., Jacksonville, Ill.

A PLEA FOR THE TRAINING THE HAND. By D. C. GILMAN, LL.D., President of Johns Hopkins University, Baltimore, Md. New York : Industrial Educational Association. This

is an excellent paper on the importance of teaching drawing in the public schools.

THE NATIONAL SIN OF LITERARY PIRACY. An earnest and vigorous exposition of the moral aspects of the international copyright question is something that has been much needed. Such a paper has now been published by Charles Scribner's Sons, New York. The publishers will send any one a copy upon receipt of 5 cents.

THREE KINGDOMS : A HAND-BOOK OF THE AGASSIZ ASSOCIATION. By HARLAN H. BALLARD, President of the Association. Price, 75 cents. New York : The Writers' Publishing Co. This is the official manual of the Agassiz Association, organized for the study of natural objects. It opens with a history of the association, which has now grown to such huge proportions, extending in every direction throughout the United States, reaching over Canada into England, and even as far away as Japan. It is a practical hand-book for all lovers of nature, and deserves to be put in the hands of all young people. In this, as in other publications, the Agassiz Association has shown that there is a practical method by which the average intelligence and self-reliant character of the people outside the school-room, as well as in it, can be effectively stimulated, not only for their own intellectual improvement, but for that of their children and neighbors. This must eventually affect the curriculum of the public schools and hasten the much-to-be-desired object of creating a demand for better and more natural methods of instruction.

THE SANITARY CODE OF THE BOROUGH OF ASBURY PARK, N. J., together with the Rules and Regulations of the Board of Health, Local Sanitary Conditions, and the Progress of Health Protection in Asbury Park. A pamphlet of thirty-two pages, containing such rules and regulations for the protection of the public health as many other village communities and authorities might profit by.

"HOME SANITATION" was the subject of a lecture before the Y. M. C. A. of Cleveland recently, by Dr. D. H. BECKWITH, Member of the Ohio State Board of Health, which, as

reported by the *News and Herald*, was admirably adapted to popular comprehension and practical application, and largely attended. It treated of cleanliness in its most comprehensive sense—of avoidable means of contaminating the atmosphere and the importance of ventilation ; of food and drink ; of temperance in the use of luxuries and abstinence from all depressing and dangerous habits.

REPORT ON PROGRESS IN MEDICINE, by J. B. MARVIN, M.D., Professor of Theory and Practice of Medicine and Clinical Medicine in the Kentucky School of Medicine, a paper read before the Kentucky Medical Society, 1887, and reprinted from *South-Western Medical Gazette*, is a pamphlet of twenty-four pages, which summarizes the progress made in the study of bacteriology, pathology, and therapeutics during the preceding year, dwelling in particular upon Bergeon's method of treating consumption, but concluding, as most good observers appear to have concluded, that it marks no progress—except in experimentation.

RECENT ADVANCES IN THE TREATMENT OF PULMONARY CONSUMPTION, a paper read before the Medical Society of the State of Pennsylvania, 1887, by SOLOMON SOLIS-COHEN, A.M., M.D., Consulting Physician to the Jewish Hospital, Philadelphia, etc., extracted from the Transactions of the Medical Society of the State of Pennsylvania. The "recent advances" chiefly consist in urging with increased energy the importance of *nutrition* as the mainstay, no matter what the medication may be, but preferably such medication as will stimulate nutrition. "The inhalation of compressed air, dilating the air-cells as it does by gentle and equable pressure, aids nutrition by securing the proper exposure of venous blood to the atmosphere." Bergeon's method has in some cases, under the author's observation, been followed by reduction of temperature, less cough, improved character of the expectoration, more sleep, increased appetite, and cessation of night-sweats. "These palliative results, great in themselves, are still greater in the removal of obstacles to nutrition. . . . I have seen no cure ; but, then, there has not been time either to permit recovery or to test its reality."

OPERATIONS FOR MASTOID DISEASES, TREATMENT OF CHRONIC SUPPURATIVE OTITIS, and STATISTICAL REPORT OF 5700 CASES OF EAR DISEASES, are the respective titles of three reprints from the *Journal of the American Medical Association*, of papers by SETH B. BISHOP, M.D., Surgeon to the Illinois Charitable Eye and Ear Infirmary, to the Illinois Masonic Orphans' Home, etc., Chicago, Ill.

SYNOPSIS OF THE SECOND HUNDRED CASES OF URETHRAL STRICTURE Treated by Electrolysis, with Cases, by ROBERT NEWMAN, M.D., New York, reprinted from the *Journal of the American Medical Association*; and THE GALVANO-CAUTERY SOUND and its application in Hypertrophy of the Prostate, with reports of cases, reprinted from the *New England Medical Monthly*, are valuable contributions to the respective subjects treated of.

FIFTH REPORT OF THE STATE COMMITTEE ON LUNACY OF THE COMMONWEALTH OF PENNSYLVANIA, SEPTEMBER, 1887, pp. 210, with plans of hospitals and maps of hospital districts. The Committee felicitates itself and the public on an increased interest in the general condition and more generous legislative appropriations for the care of the insane poor in the State. Progress in this direction is shown by an interesting sketch of its history since 1750, when the necessity for some refuge for the insane in Pennsylvania first became apparent, and, through the instrumentality of Dr. Thomas Bond, was provided for by the establishment of a free hospital for the insane sick poor.

At the date of the report before us there were in institutions for the care of the insane in the State an aggregate of 6259 patients, distributed as follows: In State institutions, 4222; in private hospitals and licensed houses, 567; in Philadelphia Hospital (Blackley), 509; in almshouses, 898, and in prisons, 63. The proportion of insane and idiots to population in the State was, in 1840, one eleventh per cent; in 1880, one seventh per cent. In 1840, 1 to every 1056 population; 1880, 1 to every 615—one nineteenth of one per cent in 40 years—an increase so small, to say the least, as to be no cause of anxiety, and possibly only apparent by increased attention to the subject, or at the most by immigration.

The report is fruitful in practical conclusions from a large

amount of interesting detail in the general plans, construction, and management of institutions for the care of the insane, and deserves wide distribution throughout the country.

LUNACY IN ENGLAND.—The report recently issued by the Commissioners in Lunacy in England shows that, although the ratio per 10,000 of lunatics to the whole population of England and Wales had fallen to 28.98 in 1885, to 28.76 in 1886, and in 1887 it had further declined to 28.64, it is again rising, as on the 1st of January, 1888, it was 28.87. This seems to justify the doubt expressed by the Lunacy Commissioners last year that the decline in the rate of lunacy was not permanent. Up to 1885 the increase had become almost alarmingly steady, in spite of modern improvements in the treatment of the mentally infirm. The ratio was as low as 18.67 in 1859, and had gradually mounted up to the 1885 high figures of 28.95. The total number of persons registered as lunatics, idiots, and persons of unsound mind is 82,643, and this shows an increase of 1752 on the figures of the previous year. From 1859 to 1884 the annual advance was most marked among women. Since 1885 insanity has more frequently afflicted men.

Of the 1886 admissions, numbering in all 13,624, the largest percentage were cases ascribed to hereditary influence. These cases numbered 22.6 per cent. The next largest percentage, 19.2, refers to cases in which the predisposing cause is described as "previous attack." In 17.2 per cent of cases neither exciting nor predisposing cause could be assigned. After these the largest percentage of cases (13.4) is traced to intemperance, a cause operating with nearly threefold frequency among men than among women. To privation and starvation 5 per cent of the cases are attributed to congenital defect, a little over $4\frac{1}{2}$ per cent. Nine per cent of the women's cases are stated to be due to "domestic worries, including loss of relatives and friends," while 3.6 per cent of the men have been overbalanced in this way. Of the moral causes the most productive were "mental anxiety, worry, and overwork." To religious excitement a little over 2 per cent of the cases was due.

THE GACETA SANITARIA DE BARCELONA.—The first number of this new periodical was issued on the 10th of September

last, and will appear on the 10th of each month in large quarto of thirty-six pages.

It is published as the organ of the Cuerpo Médico-Municipal. The first number contains a variety of articles, mostly original, and a detailed report of the sanitary condition of Barcelona for August.

Barcelona population in 1887 was 248,943. Deaths in August last, 709; births, 586; marriages, 161. The deaths from contagious diseases, 143. There was a remarkable freedom from deaths by violence; 2 from accident, 1 by suicide, none by judicial sentence.

The greatest number of deaths, 181, was caused by diseases of digestive organs; of the respiratory organs only 61; but from cerebro-spinal diseases, 107.

Barometer for month, highest, 770.35; lowest, 754.83. Thermometer, highest, 89; lowest, 59.

MEDICAL EXCERPT.

SULPHONAL: A NEW HYPNOTIC.—Sulphonal, diethylsulphon-dimethyl-methane, $(\text{CH}_3)_2 = \text{C} = (\text{SO}_2\text{C}_2\text{H}_5)_2$, comes to us as a new hypnotic, with all the recommendations and the absence of disadvantages for which we are now prepared in connection with the introduction of therapeutic novelties. Sulphonal is represented as being free from taste and odor, as assisting and inducing sleep, and as being entirely innocent of unfavorable effects during and after its hypnotic influence, even in disease of the heart. Both Kast and Rabbas speak highly of the drug. The latter has tried sulphonal particularly in the insomnia and excitement of the insane, and goes so far as to propose to put the new remedy at the very head of all the hypnotics. Sulphonal is a white crystalline powder, but slightly soluble in water; given in doses of one to four grammes (about fifteen to sixty grains) floated on water. It rarely disappoints expectations; it is least satisfactory in the more severe forms of mania. Sleep usually comes on within half an hour—seldom later than one or two hours, and lasts unbroken for six to eight hours. It may continue, indeed, for several hours in the forenoon, and not unfrequently it leaves behind it a quiet condition during the day. The sleep is per-

fectly rational, neither accompanied nor followed by unfavorable complications. Tolerance does not appear to become established, so that the dose (average two grammes) does not require to be increased. Comparative observations with methane, paraldehyde, etc., even in large doses, were favorable to sulphonal. Sometimes, indeed, it acted promptly where chloral had failed, and while chloral appears to be the only rival of the new hypnotic, sulphonal is free from the serious objections to the other drug from the side of the circulation. Inasmuch as sulphonal is comparatively slow but prolonged in its action, it is possibly but slowly absorbed (being so insoluble) and its action but gradually developed. It is possible the repeated small doses—say one half gramme every two hours—may diminish or completely remove conditions of excitement in the insane.—*Centrbllt. f. klin. Med.*, 1888, No. 28, p. 497.

In a state of perfect purity, sulphonal is said to be absolutely devoid of taste and odor, and no disagreeable after effects of any kind whatever, such as headache and the like, have ever been observed to follow its use.

By a recent pamphlet issued by Messrs. W. H. Schieffelin & Co., of New York, we are informed that the *Farbenfabriken vorm. Friedr. Bayer & Co.*, Elberfeld, have, at the suggestion of Professors Kast and Baumann, undertaken the manufacture of the remedy, and supply it to the trade in a state of perfect purity under the name of "*Sulfonal-Bayer*"—the same as that used in the various experiments and observations by Professors Kast and Baumann, and others, in defining its use. *Sulfonal-Bayer* is supplied in half ounce and one ounce bottles, or in the form of Soluble Tablets, containing fifteen grains each, put up in tubes of ten tablets, by the Messrs. Schieffelin & Co., who are sole agents for the United States.

WATER AND OBESITY.—A physician of Erlangen, Dr. Lorenzen, experimented with himself for the purpose of seeing the effects of imbibition of water upon the bodily weight. For four years he indulged in the not ascetic task of drinking two gallons of beer daily, and discovered the remarkable fact that he had increased his weight seventy-eight pounds. On stopping the ingestion of water (beer) he reduced his weight fourteen pounds in seven days. Dr. Lorenzen's experiments

are being performed daily by a large class of our esteemed Teutonic citizens.—*Medical Record*.

GRAFTS OF CHICKEN SKIN.—G. Martin reports a case (translated from the French for *Physician and Surgeon*) of a child whose entire scalp was burned, and eight months later grafts of the skin of fowls were used with the result of obtaining a regeneration of skin seven centimeters by eight in two months. In speaking of transplantations, he says: "We think that the skin of fowls, and especially of chickens, is to be recommended; it is supple, of fine texture and vascular, stretches well over the surfaces, and adheres without reabsorbing, giving important islands of epidermis which develop and spread, forming new tissue, soft and quite different from ordinary cicatricial tissue. The manual of operation which we employ in our grafts is very simple. The skin should be raised under the wing of young chickens, and should have no cellular tissue attached and no fat; the shreds should be one half to one centimeter square; sutures are useless, the skin adhering very easily. The wound and the dressing should be rigorously aseptic. Iodoform gauze and light cotton compresses may be used." These are certainly interesting facts for the general practitioner, who often has extensive ulcerated surfaces to treat; and patients often, through ignorance of the amount of pain given in taking the grafts from the arm, decline to submit, whereas the chicken skin can always be readily obtained. We are inclined to think that this effective aid to the healing of extensive denuded surfaces is not resorted to as frequently as it should be. It not only hastens repair, but lessens the amount of cicatricial contraction which follows. Recently several operations have been reported in which the contraction that follows the healing of long-standing trachoma has been effectually overcome by transplanting mucous membrane from the lower lip.

REED & CARNRICK'S SOLUBLE FOOD.

(From *Boston Medical and Surgical Journal*, September 27th, 1888.)

IN the *Journal* of August 2d, 1888, was published an analysis of Carnrick's Soluble Food, copied from, and credited to, the Report of the New Jersey Dairy Commissioner.

Dr. Newton, the Commissioner, has forwarded to us a circular, recently issued, bearing upon the same subject, to which it is necessary we should, in common honesty, give equal publicity to that given the first quotation. The circular is as follows :

STATE OF NEW JERSEY,
Office of the Dairy Commissioner, Paterson, N. J., September 19, 1888. }

In the report of this department to the Legislature for the year 1887, an article by Professor A. R. Leeds, entitled "Foods for Infants and Invalids," was published.

Messrs. Reed & Carnrick have, in a communication to this office, taken exception to some of the statements therein made, claiming that the amount and character of the ingredients of their food preparations were misrepresented. In order that these gentlemen might receive full justice, I offered to have the analytical work revised by a chemist of reputation, who had never had any business or professional relations with either the State or Reed & Carnrick; and it was also stated that the results of this series of analyses would be published by this office.

Accordingly, Professor Elwyn Waller, Professor of Analytical Chemistry at the School of Mines, Columbia College, New York, was requested to purchase a package of "Carnrick's Soluble Food" in the open market, analyze the contents thereof, and report the results to me. Below is a copy of his report :

"I examined a sample of 'Carnrick's Soluble Food' (purchased by myself from Eimer & Amend). I find that 38.26 per cent of the albuminoids which it contains are in the soluble form. The sample also gave readily, the biuret reaction for peptones. I failed to detect in the food, when moistened, any of the 'hard, unchanged particles of casein' which it has been asserted that it contains.

"My results lead to the conclusion that the casein in the preparation has been partially rendered soluble by the action of the digestive ferment as claimed by the manufacturers.

"(Signed) ELWYN WALLER, PH.D."

I append herewith a letter on this subject that I have received from Professor A. A. Breneman, S.B., formerly Pro-

fessor of Chemistry at Cornell University, now analytical chemist at 97 Water Street, New York.

WILLIAM K. NEWTON, *Commissioner*.

NEW YORK, September 18, 1888.

Dr. W. K. Newton, State Dairy Commissioner of New Jersey.

DEAR SIR : The report of your department for the year 1887, refers to certain preparations made by Reed & Carnrick, of New York, in a way which, from my knowledge of their work, seems to do them injustice.

The statements to which I especially refer are :

(1) That the milk solids in the preparation known as Carnrick's Soluble Food contain merely the dried casein of the original milk, neither changed nor modified by any process of digestion.

(2) That the analysis of this food given in the Report of the State Board of Health of New Jersey for the year 1885 correctly represents it, giving as it does only 10.25 per cent of total albuminoids.

(3) In the analysis of the preparation known as Liquid Peptonoids (New Jersey State Dairy Report, 1887) the proportions of alcohol and albuminoids there given are made the basis of comments which are extravagant in language, and unnecessarily severe.

On February 20th, 1888, I made, at the request of Reed & Carnrick, a test of the peptonized milk received in good condition from their factory. Of the albuminoids of the original milk 46.6 per cent were found to be rendered soluble (that is, no longer precipitable by boiling or by acids). Through the process of digestion such soluble nitrogenous matters must, under the circumstances, consist of peptones, albumoses, and caseoses, products of the modification of the original albuminoids of the milk by digestion.

Having made many analyses of this food during the past three years, I have never found the proportion of albuminoids to run below 16.5 per cent as determined by combustion with soda lime. The average of fifteen analyses, made since January 1st, 1887, shows 18.96 per cent of albuminoids. These results also agree well with the analyses of the same food made by Stutzer and other well-known chemists.

As to the liquid peptonoids, the proportion of albuminoids is limited only by the quantity which can be kept unchanged in solution. Sixteen per cent of alcohol is necessary to prevent decomposition of the albuminoids, and no quantity greater than 3 per cent of these can be held in solution in this liquid. Many attempts have been made to accomplish a better result, but in all cases the excess of albuminoids was deposited after a time, or (with reduced proportion of alcohol) decomposition of the albuminoids occurred.

Very respectfully,

A. A. BRENNEMAN,

Analytical and Consulting Chemist.

“ALL COWS’ MILK SHOULD BE BOILED BEFORE BEING GIVEN TO INFANTS. It is the general opinion of those most competent to judge that the milk is infected only when the tubercular process has invaded the glandular tissue. But in view of great difficulty of recognizing mammary tuberculosis in cows, it is safe to look upon all raw milk with suspicion, and to allow infants to drink it only after it has been rendered innocuous by boiling. With goats’ milk, however, no such precaution is necessary, for a tuberculous goat is one of the rarest of curiosities.”—*Dr. Nocard, in a Paper read before the Congress for the Study of Tuberculosis, Paris, July 25th, 1888.*

THE MILK FOODS are produced by combining the cooked cereals with condensed milk. The latest of these preparations, Carnrick’s, uses partially peptonized milk. The starch is changed to dextrine and not into glucose, as the latter is fermentable. The composition of this food is stated to be 45 per cent dextrine, 45 per cent partially predigested evaporated milk, and 10 per cent milk sugar. Practical experience within the past two years has proven that this food supplies sufficient nourishment for a child without any further addition of milk.

The importance of giving infants a suitable supply of water is not sufficiently appreciated. Particularly in summer diarrhœa, when there is danger from loss of fluid, water should be offered at short intervals. Babies often wish the breast or bottle because they are thirsty, and not hungry. A restricted

diet and a more liberal supply of water would doubtless prevent many attacks of diarrhœa.—*Henry Dwight Chapin, M.D., on "Nutrition of Infants," in the Dietetic Gazette.*

SALICYLATE OF SODA, is, according to Jaccoud, the best antipyretic in the febrile stage of tuberculosis. It is inadmissible in cases in which clinical experience shows that quinine should be used.

It may be given to the extent of fifteen to twenty grains, or half a dram at most, in twenty-four hours. In quantities of fifteen grains daily it may be continued with advantage for a long time, taking care, however, to secure absorption by giving it in large quantities of liquid, preferably in water, to which a small quantity of alcohol has been added (*eau alcoolisée*).

The contraindications are : Disease of the kidneys, in inflammation of the lungs from fear of asphyxia, and in disease of the heart.—*Journal de Médecine de Paris.*

CONTRAINDICATIONS FOR THE USE OF BLISTERS IN DISEASES OF THE HEART.—Jaccoud strongly condemns the negligence of physicians who fail to determine the condition of the kidneys before prescribing for patients suffering from disease of the heart.

Whenever the renal secretion is unhealthy, when even a small quantity of albumen is found in the urine, the application of blisters over the cardiac region should be rigidly proscribed.

Physicians who neglect to observe this precaution very often involuntarily increase the disease. This imprudence is often the result of ignorance of the clinical fact ; sometimes of failure to inquire into the details of the case and to examine for albumen, and even of a culpable temerity which leads to the application of blisters even when albumen is present.

The rule here given should never, according to Jaccoud, be neglected. In improper cases tincture of iodine is a safe application, and will serve the same purpose as a blister.—*Journal de Médecine de Paris.*

TUBERCULOSIS IN MEN AND ANIMALS.—The first session of the Congress for the study of tuberculosis in men and animals

was held in Paris, on the 25th and 31st of July last, under the presidency of Professor Chauveau.

The presence of bacillus in cases of tubercle is now almost universally accepted as the most reasonable theory, and the efforts of practitioners are directed to the destruction of this element. If the treatment so far has not met with much success those interested may find more, if they direct their attention to its prevention. The conclusion of the Congress is, that the source of infection is in the use of food infected with tubercle, and that to prevent the spread of tubercle it is sufficient to thoroughly cook the meat and always to boil the milk. The following were the principal subjects of deliberation :

I. More extensive powers should be given to boards of health, and the general surveillance of committees on epizootics should be given to them, and consequently the diseases of animals and all questions relating to the contagions of domestic animals, even those which heretofore have not been considered transmissible to man, should be submitted to them.

II. The Congress has seen with satisfaction that tubercular diseases among cows has been placed among contagious diseases, and the decree has been signed by the President of the Republic.

III. It will be necessary to insist firmly on the necessity of seizing and destroying all the meat of animals affected with tuberculosis wherever may be the place from which they come, or whatever may be their apparent health.

IV. These considerations are applicable to every country in the world, because wherever the place may be, the question of tuberculosis presents the same problems for solution as in France.

V. It is necessary to distribute among the people, especially in the country, such plain and intelligible instructions as will enable them to guard against the dangers of eating the meat or drinking the milk of tuberculous animals. They should also be instructed as to the best means of disinfecting animals and animal excreta, and of enabling them to destroy all the germs of disease.

VI. Cows intended for the production of milk should be subject to a special supervision to prevent the milk of any

tainted with contagious disease from being offered for use, and this supervision should extend alike to all establishments in which animals are kept for such production.

TO PREVENT AND CURE LAME FEET caused by too much walking, a powder called "Fustreupulver" by the Germans, and extensively used in the army, by sifting it into the shoes and stockings, is equally commendable for letter-carriers and others subject to like conditions. It consists of 87 parts of pulverized soapstone, 10 parts of starch, and 3 parts of salicylic acid. It keeps the feet dry, prevents chafing, and heals sore spots.

A NEW MATERIAL FOR ABSORBING AND DEODORIZING FÆCAL MATTER AND URINE.—Among the many materials that have been suggested and used from time to time for the purpose of absorbing and deodorizing fæcal matter, not one, perhaps, is so interesting to those engaged in sanitary science as common slag, which has puzzled for a long time many a practical chemist and engineer to know to what purpose it may with profit be applied. It is said to be extremely porous, rendering the soil more absorbent, and is also of manurial value, on account of the notable quantity of phosphoric acid it contains. The following additional advantages are claimed for it: (1) The cheapness of the material, the cost being roughly estimated to be from \$1.25 to \$2.50 per ton, including crushing and carriage; (2) its supply being practically inexhaustible; (3) its porous property, which, independent of (4) its manurial qualities, renders it valuable to clayey soil.

A sample was exhibited which had been in use five weeks ago, in which it was impossible to detect the slightest smell. The method of using it is similar to that adopted in the other earth-closets. The pan is first charged with a certain quantity of the crushed slag, and after use another quantity is put in, the total quantity necessary, according to the inventor, being a third less than ordinary dry earth—that is to say, six persons would require one third of a hundredweight of defecating matter per week. These claims are so strong that a careful trial of this method, and, indeed, of any new method.

which aims at the healthy as well as useful disposal of so great a nuisance, is well worthy the consideration of every sanitarian.—*Lancet*, July 7th, 1888.

OIL OF BAY *vs.* FLIES.—It is stated that expressed oil of bay (*huile de laurier*) is extensively used in Switzerland by butchers to keep their shops free from flies, and that after a coat of oil has been applied to the walls none of these troublesome pests venture to put in an appearance. This remedy has also been tried and found effectual in the south of France in preserving gilt frames, chandeliers, etc., from becoming soiled. It is even remarked that flies soon avoid the rooms where this application has been employed.—*American Druggist*.

SACCHARINE seems now to be extensively used as a substitute for sugar in syrups and preserves, and even in *champagne*. This last is a fact fully recognized in commerce. Even as a medicine saccharine is not harmless. M. Worms says that diabetic patients who use it for a fortnight lose their appetites. M. Dujardin Beaumetz thinks, however, that as a therapeutic agent saccharine is useful in the case of the few diabetics who cannot do without sugar. The *Gazette Hebdomadaire des Sciences Médicales* thinks there can be no doubt as to the propriety of preventing its *general* use.

CINCHONA IN JAVA.—The following is a translation of what is said regarding the extent and production of the Government cinchona plantations: These cover an extent of about 1000 bouws, of which extent a great part is not yet in full bearing.

The harvest of 1885 came to 432,000 $\frac{1}{2}$ -kilograms.

That of 1886 came to 525,000 $\frac{1}{2}$ -kilograms.

While that of 1887 will be about 700,000 $\frac{1}{2}$ -kilograms.

It is shown by the above figures, which give the produce of the original Ledgeriana plantations of Tjinjiroean, that we have hardly arrived at the first beginning of the regular full harvests, and that when the whole extent shall have reached maturity, the produce may, without any extraordinary effort, be brought up to 2,000,000 $\frac{1}{2}$ -kilograms a year. The report is signed by the secretary, A. H. Berkhout.—*The Tropical Agriculturist*.

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TO THE YEAR 1888.

AN ADDRESS DELIVERED BEFORE THE CONGRESS OF THE
ASSOCIATION OF PUBLIC SANITARY INSPECTORS OF GREAT
BRITAIN, AT BRIGHTON, AUGUST 25, 1888, BY EDWIN CHAD-
WICK, C.B., PRESIDENT OF THE CONGRESS.

WHEN, in 1881, I presided over one of the sections of the Congress held here, the chief topic of my address was on the sanitary defences against severe epidemics. It was shown that by sanitation and by house-to-house visits and treatment of the premonitory symptoms of the cholera, full fifty thousand lives were saved beyond the rate of loss in Sweden, where the ordinary death-rate was lower than in Great Britain, but where our precautions were not taken ; while at St. Petersburg by the adoption of our practice some twenty thousand lives were saved at each of two visitations. But, perhaps, under the influence of the false Malthusian theory, still prevalent among ill-informed politicians, no notice was taken and no recognition given to the prevention of these losses of life, greater than in the heaviest battles. It is characteristic of the common state of the popular information with which we have now to deal, that while a single death from violence or passion excites general attention, deaths weekly from preventible causes pass without any notice whatever.

I may now, I conceive, best submit a view of the progress made in sanitation since then. I take, as the test standpoint, the death-rate for the previous year, 1880, when it was 20.5 per 1000 of the population of England and Wales. In 1887

the death-rate was 18.8. In the last four quarters of this year it was 17.6 per 1000. The recent modified death-rate, still mainly from preventible causes, in the year 1887, was only 18.8; and on Dr. Farr's estimate of the average value of each life the saving in 1887 was £7,635,000 in money—nearly the amount of the poor rates for the year. Examining the reports sent to me of the work done in a number of towns, and comparing them with each other, looking particularly at the work done by the sanitary inspectors under the direction of the health officers, as to the number of houses in a bad sanitary condition which have been improved under their direction, and as to the accumulations of putrefying matter which they have removed, it is certain that a large share of the reduced death-rate is due to their service—imperfectly as it is yet organized, and obstructed as it still is. Looking, however, at the extraordinary recent reductions of the death-rates in the metropolis (where it was not long since twenty-four in a thousand), but has recently come down to fourteen and fifteen in a thousand, I cannot but consider that much of that reduction must be due to climatorial causes. On the occurrence of a great thunderstorm, immediately after it has cleared away there is an experience of a new and fresh atmosphere. The storm has done for a time what must be the constant work of good sanitation. Good sanitation will, in time, do more than that permanently. By the Consolidated Metropolitan Sanitary Commission, which had charge of the whole of the house drainage, as well as the drainage of the roads, and also of the land drainage of the suburbs, plans based upon trial works of blocks of buildings—which trial has since been verified by the results of work in a number of towns where the system of “circulation *versus* stagnation” is followed—constant supplies of pure spring water would, by this time, have been carried into every house or on to every flat in every house, without cisternage and stagnation and de-aeration. The fouled water would have been constantly carried out of every house by self-cleansing house drains and sinks into the self-cleansing sewers of the streets, and from those self-cleansing sewers on to the sewage farms or gardens fresh and without loss of strength by putrefaction. What would have been the grand result of this system is indicated in towns more or less com-

pletely on this separate system, for in these towns there is a reduction of the death-rates by fully one half. And there can be no reasonable doubt that all of the like reductions might have been effected on the same principle in the metropolis and in other cities. It is too long a story to describe the combination of sinister interests in expensive Parliamentary procedure and in expensive works by which the Government were put in a minority against the continuance of the first General Board of Health, and of the Metropolitan Sanitary Commission. By that first General Board of Health local authorities and executive officers were distinctly warned that they were responsible under the old common law categories for acts of "nonfeasance," of "misfeasance," and of "malfeasance." If an architect or a contractor supplied with a good plan and with the latest improvements before him were from *mala praxis* to construct an edifice with a large stagnant cesspit beneath, productive of disease to the occupants, he would certainly be liable in damages for his malfeasance, and it admits of clear proof, from what has been done in various other towns, that, had the works on the plans prepared been fairly carried out in the metropolis, the metropolitan death-rate would at this present time be reduced by at least five in a thousand, and would probably have stood at twelve in a thousand from the year 1856. The river, also, would have been purified first instead of last, and would now be pure, instead of being in a condition which Lord Bramwell's Commission described as "a disgrace to the metropolis and to civilization." It appears to me to be of importance at this time to display in the way of warning the wholly unimagined and gigantic extent of evil of sanitary "malfeasance" in the results on the metropolis, the cost in lives, and of the money value in lives chargeable and inflicted on the metropolis by *mala praxis* and by "malfeasance." As to the value of lives, I take the estimate of Dr. Farr in relation to the average actual cost and the average actual value of every human being in England at £159. The total loss of lives every day has been 98, and the loss of lives in money value has been every day £15,523. Every week the average total loss of lives has been 685, and the total loss in money £108,963. Every year the total loss of lives in the metropolis has been 35,636, and

in money £5,666,059. Such will be found to be the rate of the cost of the delay of the practical application of the power of sanitary science in competent hands. I submitted these results to Lord Herschell as charges for investigation under the commission for the examination of the working of the vestralized Metropolitan Board of Works. No doubt the discrimination of cases would have been difficult between the individuals, who were, we must assume, utterly unconscious of what they were being made to do, and those who were not, or who, in ignorance of the *mala praxis*, nevertheless, could not now equitably be subjected in such penalties as would have befallen them from the judges of old. No doubt also the investigation would have been laborious and difficult, yet it would have been useful for the public instruction and for the future warning to local administrative authorities. As the proved acts of malfeasance in comparatively small matters have served in the minds in Parliament, as well as of the public, for the discontinuance of vestralized authority in such matters, it seems to have been considered unnecessary to enter into the examination of such large and complicated inquiries. It is, nevertheless, of vital importance that the powers of the great factors of sanitation should be vindicated, and shown to be so certain, from what has been done, that a capitalist would be safe, from proof, of a reduction by one half of a death-rate in contrast with a reduction contracted for of one third. A contractor, with enlarged and commensurate powers, might contract for the reduction of the excessive death-rate of Manchester, now twenty-seven in the thousand to sixteen in a thousand; and this reduction would be attended, as shown in the manufacturing town of Leek, with an augmentation of five years of the average duration of life and working ability. And at what cost? At not above one third of the insurance charges of the twenty-four millions of money annually paid by the wage classes of England to provide against excessive sickness and premature mortality; nay, I believe, at not above one third of the insurance charges against sickness and mortality enforced by a special executive machinery invented by Prince Bismarck for Germany.

The sanitary works of drainage and improved water carriage are, however, sometimes countervailed by overcrowding. Let

us look at the case of the workingman under that condition. In some experiences got out at Glasgow, it is there shown that there is an excessive death-rate in single-roomed tenements, a lower death-rate in double-roomed tenements, and a still lower death-rate in the three-roomed tenements. Dr. J. B. Russell, the able health officer of Glasgow, states that 125,000 of the wage classes live in the overcrowded one-roomed tenements, in which he portrays conditions in which morality and health are impossible. Increased living-room space must be paid for, and is it not worth while for the mechanic who is getting his twenty-five shillings a week to pay two or three shillings a week more for such space as he may get in a model dwelling, when it is proved that on an average he obtains by the change full ten years more of life and working ability? Compare his fate with that of a man who emigrates to a city in the United States or to one of the Australian colonies, where the death-rate is 27 in 1000, who loses by one third his chances of life and working ability, and if he have a family sees one half of his children in their graves by their fifth year.

EFFECTS OF OVERCROWDING, AND HOW TO DEAL WITH THEM.

I beg to offer some few illustrations as to the means of dealing with the important subject of overcrowding. When I was examining the slums of Edinburgh, I met an occupier of one of them whom I well remember. He was a strong, well-built man, who answered the questions I put to him with great clearness. He was a porter, and earned more than twenty shillings a week. I asked him how he expended the wages he got, and he stated the details of his expenditure with apparent honesty. But these only amount, I said, to one half of your earnings. What do you do with the rest of your wages? "It goes in whiskey," he said. I could not help expressing my surprise and concern that so sensible a man as he was should give himself up to such a course. "Well, sir, this is the only place I could get; and if you were to live here you would drink whiskey too." It so happened that while I was there I did feel a coppery taste in my mouth, a premonitory symptom from so depressing an atmosphere, and immediately I left it, it is the fact that, rightly or wrongly, I sought correction in a diffusive stimulant, some warm brandy and water.

The provisions which are supplied for the measure which Lord Shaftesbury got passed for the regulation and prevention of overcrowding in common lodging-houses were that they should be caved up, and that only a limited number of lodgers should be allowed in one room ; that the rooms should be properly supplied with water, with ventilation as it was then understood, and with proper drainage by water-closets. These provisions, carried out in the metropolis by the police, have sufficed to clear these houses of the epidemics of which they were previously the first centres of the heaviest attacks, and the local health officers have proposed that some effective provisions should be applied for the protection of the wage classes. Now also the rents of the common lodging-houses are paid nightly, it is proposed that on the occurrence of any case of fever, or of the maintenance of excessive death-rates by overcrowding in single rooms, that these same provisions for the common lodging-houses should be applied, under sanitary inspection, to the tenements occupied by the wage classes, the rents of which are paid weekly. In periods of the greatest prosperity, the changes of work from district to district, leading to changes of residence, are very great, as experienced by the large changes of residence by children with great inconvenience in the board schools. There are special reasons for the enforcement of the provisions in question for the protection of immigrants. At one third of his present induced or necessitated expenditure, occasioning a short and wretched existence, in the single-room tenement, as in the instance I have stated, the artisan may be enabled to obtain the increased space in improved residence, which will insure to him a prolonged and healthful working ability, and enable him to make reserves for ease and respectability when that working ability naturally ceases by age.

COMPETITIONS FOR REDUCTIONS OF DEATH-RATES ADVISED.

I deem that the greatest gain of sanitary science, developed since we last met here, are contained in the proofs obtained of the power of the prevention of the chief of the children's diseases. In the large district schools, the districts of the Poor Law Unions, the children's chief diseases are now practically abolished. Those institutions may be said to be chil-

dren's hospitals, in which children, orphans of the lowest type from the slums, are taken in large proportions with developed diseases upon them often only to die from constitutional failure alone. Yet in a number of these separate schools there are now no deaths from measles, whooping-cough, typhus, scarlatina, or diphtheria. The general death-rate is about ten in a thousand, and of those who are not in the probationary wards, those who come in without developed disease upon them, the death-rates are now less than three in a thousand, or less than one third of the death-rates prevalent among the children of the general population of the same ages. To illustrate this progress of the chief rudimentary and sanitary factors, I may give one example, of an institution where the old death-rate was the common outside one of twelve in a thousand. The institution was first properly drained, and the premises cleared of foul sewage smells, by which clearance the death-rate was reduced by more than one third, or to eight in a thousand. Then followed frequent head-to-foot washing with tepid water, when the death-rate was again reduced by more than one third, and with some other sanitary improvements—namely, better ventilated rooms, and better bedding of the children, with one child only in each bed. Here the death-rate has been reduced to less than three in a thousand, and that with children of the lowest type. In a visit to one of these half-time schools, after an interval of several years, I was forcibly struck with the appearance of the children, as less pallid, and as showing less of the dull, leathery look than I had ever seen before. They were bright and fresh-looking; and I observed to the manager that he must have had a new class of children since my last visit. His answer was *No*, but that since the sanitary improvements had been made in the lower districts the children received from them had the improved type which had struck me. Other observations on a larger scale in civic populations, where foul tenements have been reduced, streets enlarged, and better ventilation supplied, show like improvements in the type of the population. The cost of a superior mental teaching power in the half-time schools of the proper size (upward of 700) is £1 per annum, and of a superior physical training 10s. per head in elementary schools on the half-time principle. If these economies were made generally prevalent, they would

effect a saving of a million and a half per annum over the present charges of elementary education. Ignorance objects to the cost of living in the district half-time schools, but at the cost of one vagrant or mendicant or delinquent existing at large upon spoil, two or three children of hereditary mendicants or delinquents receive an industrial and mental teaching, which carries them to good and increased wages, a gain which has proved the greatest factor to the late reduction of juvenile delinquents.

EFFECTS OF SANITATION DISPLAYED IN THE MILITARY SERVICE.

Let me next exemplify the progress of the power of sanitation as displayed in military services. A quarter of a century ago the death-rate in the Guards was twenty per 1000. It is now six and a half per 1000, and, as I could show, it is yet much too high. The death-rate in the home army was seventeen per 1000. It is now about eight per 1000. But Germany beats us with her death-rate of five to six in a thousand. In France it is ten in a thousand; in Austria, eleven; in Italy, eleven; in Russia, eighteen, an army death-rate three times heavier than in Germany. In 1858 I read a paper at the Association for the Advancement of Social Science at Liverpool, in which I represented the expediency of applying to the protection of the Indian army the sanitary science which had saved the second army in the Crimea. I followed up this recommendation persistently, by official paper after paper and by interviews with the authorities, until a commission was obtained, of which Dr. Sutherland and Mr. Rawlinson, Commissioners of the Crimea, were members. The old Indian army death-rate was sixty-nine in a thousand. From 1879 to 1884 the death-rate was reduced to twenty per thousand, and now it is about fourteen per thousand. In the six years from 1879 to 1884 the aggregate saving was 16,910 lives; and on the military estimate of £100 per life, the saving in money during the six years—as estimated by our late eminent sanitary ally, Professor de Chaumont, of the Netley, whose loss is greatly to be deplored—was £1,691,000. At the present reduced rate of 14 per 1000 the saving may again be reduced in proportion.

Seeing the great saving that has been effected by sanitation,

so far as the science has been applied in the military service, eminent sanitarians in India have pressed for its application for the protection of the civil population. It appears that its application is generally obstructed by the ignorance of the local authorities, who have yet to be made aware of the gains derivable from it. I have written to our excellent viceroy in India, Lord Dufferin, upon this subject, and have received from him assurances that he has left provisions for its promotion by examples.

I have recently been made aware of the prevalence in high political statesmanship of a deadly error, that sanitation is opposed to the Malthusian doctrine, "that pestilence is the great check to the growing excess of population." Unfortunately, I find a younger generation who have never read the demonstration of that great error given in my report of 1842—that pestilence is attended by a rapid augmentation of births, does not reduce the numbers of populations, but only weakens them and augments the proportions of the dependent pauperism. I have brought this great error and its deadening effect before our political economy club of London. In the highest sanitary conditions it is observable that the proportion of births to deaths is rather reduced than otherwise. There is one large economical effect which I have recently ascertained is now developed in connection with the sanitation of the German army. From Mr. Aird and the English contractors for sanitary works in Berlin I learn that by the manual instruction and industrial exercises given in the three years' military training, the recruits come out with an improved industrial aptitude, which imparts to them thirty per cent of higher value in the labor market. With this result of improved productive force of the whole of the working population, the military training may be said to cost the State nothing, it being really economically remunerative. But if I had been enabled to have obtained the visit of the late Crown Prince to the Norwood school when he was staying at the Norwood Hotel—he was prevented by the commencement of his fatal malady—I might have shown him that even better results are now attained and attainable on the half-time principle in large educational institutions on that principle. In them, in the juvenile stage, a military drill is imparted in that stage, superior to any that can be imparted in the adult stages of life.

In that juvenile stage industrial aptitudes are imparted which give to every two the industrial aptitudes and efficiency of three ; and this obtains for them on their leaving, at about thirteen years of age, eight, ten, or twelve shillings a week in wages—the former wages of adults. I could have also proved that all the industrial, military, and combined industrial training in the adult stages may now be better accomplished in juvenile stages of life. This is an important thesis for physical learning in national education, and shows the productive value of all that are born if they be properly trained.

ADVANCES IN SANITARY POWER BY IMPROVED VENTILATION.

Since last we met there have been, as it appears to me, most important advances made in the improvement of ventilation. In some district institutions stoves have been introduced which bring in constant supplies of fresh air, warm it, circulate it, and carry out the vitiated air. Dr. Richardson, in his own large library, has used one, a Calorigen, which introduces fresh air, warms it, and constantly discharges the vitiated air, keeping the room all over at the temperature he requires. Sir Spencer Wells informs me that he uses one for each bedroom. In one hospital some forty are used. But Dr. Bond, the eminent inventive health officer of Gloucester, has invented a stove to which the Sanitary Institute has given a prize for a very material improvement ; and now there comes out another, adapted to large edifices, used and approved by General Webber, and worked by Mr. Green, the material part of which was invented by Mr. Maxim, the great American inventor of the new army gun. I have had the working of this Maxim stove examined at the new Courts of Justice, and it is reported to be completely satisfactory, and also on shipboard at the German Lloyd's. It appears to be well adapted for large schools, where the states of the atmosphere are denoted by the fact that the death-rates among the teachers are fourfold those of the Royal Navy on the home stations.

SANITARY ADVANCE BY CHEAP PERSONAL WASHING WITH TEPID WATER.

The next invention for sanitation since our last Congress here is of machinery for personal washing. A French colonel

ascertained that he could wash his men with tepid water for a centime or a tenth of a penny per head, soap included. The man undresses, steps into a tray of tepid water, soaps himself, when a jet from a two-handed pump plays upon him tepid water, and he dries and dresses himself in five minutes, against twenty minutes in the bath, and with five gallons of water against some seventy in the usual bath. In Germany they have an arrangement devised by Mr. Grove, too long to describe, under which half a million of soldiers are now regularly washed, no doubt with the result by this important sanitary factor of the reduction of their army death-rate beyond any in Europe. I obtained the aid of Mr. (now Sir) Henry Doulton to direct inventions for some apparatus specially applicable to schools; and he has got some in which it is proved that a child may be completely washed in three minutes. I have long put forth the fact of the economy of cleanliness—that a pig that is washed puts on a fifth more of flesh with the same amount of food over a pig that is unwashed; and I have had abundant evidence that the holy doctrine of “wash and be clean” is even more economical for children and men. Look at the comparative sanitary result of the washed children, of a whole school, as against the common one of the fouled aired and badly-washed children. Look at the service to the poor mother who has no means of washing her children at home.

Added to this economical service is the new and great provision of the halfpenny dinners, which are remunerative. In sanitary science all true progress may be said to be in the little, and advances must be made in well-examined details. Such of these as are now attained give the assurances of a great future for populations. Such as are now attained, if applied, will effect a conservancy of life and force and of productive power heretofore unknown; they will prevent slaughters greater than any inflicted in modern wars; greater than was inflicted on France up to Sedan; greater than was sustained by Germany in their infliction; greater even than was sustained by the United States in their terrible civil war. But setting aside the consideration of such losses, setting aside the pains and misery of preventible excessive sickness, of premature mortality and sudden deaths, sound sanitarians may now pose as solely for the saving of money as Plutocrats.

There is yet another great promise of sanitation, of the abolition of the foul, soot, and sooty fogs, and the reduction of the clothes-washing bill of the metropolis, which I estimated twenty years ago at six millions. At Pittsburgh, N. Y., the steam power is worked by gas. In Manchester the working of steam-engines by gas is now offered at two thirds of the price of working them by the wild flame of coal; and when the municipality has charge of the gas works they may supply the houses with the internal apparatus and heating power at a rent cheaper than warming by coal. There is also promise of the extensive distribution of power by electricity. Experiments recently made at Oerlikon, near Zurich, have demonstrated the possibility of distributing power economically by means of electricity. The power of a water-wheel at Kriegstetten has been delivered at Solothurn, distant about five miles, and the net power delivered amounts to seventy-five per cent of the power supplied by the water-wheel.

Let me stay for an illustration due for Brighton itself. I have obtained a return, in form appended, which we must press to have got out for the information of all cities and places. This return, it will be seen, vindicates the high position of Brighton as a health resort for the few. For the *few*—gentry and professional persons—the death-rate of children is only 8.93 of children under five years of age. But for the *many* of the wage classes, the death-rate of children under five years of age is 45.44. For the few the mean age of death of all who die—men, women, and children—is sixty-three years, a very high average, and befitting a health resort; but for the many, the wage classes, it is only 28.8. Of the few the proportion per cent of males who attain and die of old age alone is 13.33, and of females 14.93; but of the wage classes, it is, of males, only 3.59; of females, 5.25. I am convinced that the death-rate of Brighton may be reduced by at least five per 1000; the rate, which is now seventeen, may be reduced to twelve in a thousand. Since our last Congress there has, by partial efforts, been a reduction of 2.1 per 1000, or a saving of 248 lives a year, which, at Dr. Farr's estimate of the value of each life, gives a money saving of £39,432 each year. But if the mortality be further reduced to ten in a thousand, as I am convinced it may be by thorough sanitation, the annual saving of lives will be equal to 1064 in the year, and in money

to £169,176 on the present estimated population. Sir Robert Rawlinson prepared a plan for the sanitary improvement of Brighton, correct in principle, which would have effected a large reduction of the death-rate, at an expense of some hundred thousand pounds for the entire outlay, payable by instalments in thirty years. Unfortunately, the plan was not well expounded, and was set aside for another, which has proved to be a disaster nearly as bad as that which has befallen the metropolis.

In the means of supplying water to urban districts considerable advances have been made. Clark's process for softening hard water when first introduced did not succeed in softening it below eight degrees of hardness. But since then modifications of the process have been introduced, by which the hard chalk water may be reduced to two and a half degrees, or to two degrees; and by which the whole of the hard water supplies of the metropolis may, when it is got under unity of administration, be advanced to the quality of the soft springs, derived from granitic sources. Three fifths of the water now pumped into the metropolis is pumped in to injurious waste, and has to be pumped out again. This waste may be prevented by improved meterage.

The work of land drainage may now be executed on a large scale much more cheaply and expeditiously by recently improved machinery than by spade labor, and considerable alterations will be required in the official instructions originally issued on this subject.

The generation of the foregoing and of other available administrative improvements, based on the observations of experiences of more than half a century, will be found set forth in Dr. Richardson's "Health of Nations," which Mr. Leckie has declared ought to be studied by every statesman.

Of the chief provisions of the new Local Government Act I may treat at another opportunity. I would only now advert to some of them in their more hopeful aspects. The enlargement promised of many of the areas of local administration, with some securities for sanitary qualification, offer new opportunities which may conduce to improve local organizations. If due exertions be made to inform the electors of their paramount interests in our work, they may be led to make a new and clear start, rejecting the sordid owners of

bad tenements, those who go in solely for contracts among persons whose interests are adverse to a correct administration, and those who keep up the enormous wastefulness of ignorance. If it be duly impressed on the wage classes that a large proportion of the twenty-four millions which they pay annually for insurance charges against excessive sickness and mortality may be saved by the efficient administration of sanitary science, we may expect large additions to our demonstrations of the power of those classes. But it must be admitted—despite the flagrant examples of the working of vestralization—that in the hurry of legislation large opportunities have been left for continuance of many errors. Before the close of the session, however, opportunities may be afforded for correction—that is, if the promises made of a due recognition of our science, and of the position due to it, be not longer withheld. Great are our truths for the benefit of humanity, and let us hope that their general application will not be left exclusively for other men in after times! Let us hope that our old England may be the mother of sanitary blessings as well as of colonial possessions, and that the local authorities in our colonies and our brethren in the United States will invite competitions of plans expressly for the reduction of death-rates. They will thereby direct study in a most profitable direction and will inform themselves and their constituents what sanitary science may now do and the vast economies it may effect for them; while they will, by such information, protect themselves from the quackeries and the continued wastefulness of ignorance in imperfect works, extensively perpetrated without the attainment of any commensurate sanitary results.

HYGIENE OF INFANCY AND CHILDHOOD.

By T. B. GREENLEY, M.D., of West Point,* Ky.*

THIS subject presents itself to the mind as one of vast magnitude, too great to be embraced with proper lucidity in a paper like the present, whose dimensions must necessarily be

* Read before the Section of State Medicine, thirty-ninth annual meeting of the American Medical Association.

limited. It also outlines to our view a subject of greater importance than any, or perhaps all, others that concern the welfare and happiness of the human race. For it may be said, without health there is no real happiness in this life. If children are puny and grow up with impaired functions of the various organs, they cannot become healthy adults and beget healthy offspring. It goes without saying, that without healthy parents we cannot have healthy children. The definition of "Hygiene," or "Sanitary Science," is well given by Dr. Mapother in his "Lectures on Public Health." He describes it "as an application of the laws of physiology and general pathology to the maintenance of the health and life of communities, by means of those agencies which are in common and constant use." Of late years a great impulse has been given to preventive medicine by such men as Smith, Chadwick, Playfair, Farr, Bowditch, Bell, and others; so much so that some are induced to believe that it is of modern origin. But students of the Old Testament and ancient history are familiar with the fact that some knowledge of the laws of health existed in olden times. The Mosaic code gives definite directions for the cleanliness of the person, the purification of the dwelling and the camp, the selection of wholesome and the avoidance of unwholesome food, the seclusion of persons with contagious diseases, the regulation of sexual intercourse at certain periods, and certain other points bearing on the physical well being of the Jewish nation. The Greeks and Romans, although not like the Jews, making hygiene a part of their religious duties, were far from neglecting it. "The laws of Lycurgus," says Dr. Gairdner, "are not wanting in very pointed enactments on sanitary matters, and the importance attached by all the Greek republics to physical culture is too well known to require remark." The Romans, in their early history, found time to construct the Cloaca Maxima, an indestructible and stupendous memorial of their attention to the drainage and sewerage of their city. "At a later period aqueducts were made to cover miles upon miles of the surrounding plains. They also paid attention to the construction of houses so as to secure free ventilation and drainage." In order to effect these sanitary measures they appointed State physicians. But it seems, as Christianity spread, less attention was given to means of preserving health. The monks

prayed, established hospitals, and distributed alms in the way of food and clothing, but had no idea of preventing disease ; and when an epidemic arose, regarded it as a manifestation of divine displeasure and as a punishment for sin. They had no conception that such calamities could result from uncleanness of person and filthy surroundings. During the Dark Ages filth predominated over premises and person, and ignorance and superstition reigned supreme. It is said no bathing was done from the eighth to the fifteenth century, which time might appropriately be termed the dirt period of the world's history.

In discussing the subject before us, I shall endeavor to speak, of course briefly, of the various conditions surrounding the life of infancy and childhood, the proper kind of food and nursing, and incidentally allude to some of the causes on the part of the parents which engendered weakly children. There are many causes now in force, most of which may be assigned as being due to what is termed advanced civilization, or fashionable life among women, which not only curtail vital statistics, but account for the bad health or delicate constitution of the offspring they may bring forth. I can only refer to a few of the most common of these. A great many fashionable women do not wish to be encumbered with children, and use means to prevent conception ; should they fail in such devices, they resort to measures to destroy the embryo. The idea is prevalent with many that using means to prevent pregnancy cannot impair the general health ; but it is known to observers that it tends to develop both general and local trouble. It ultimates locally in congestion and inflammation of the genital organs, which eventuates in many cases in general neuroses. We may have ovaritis, dysmenorrhœa, and uterine neuralgia, attended with severe attacks of hysteria. These conditions also frequently follow the production of abortion, should the mother be so fortunate as to escape fatal results.

It is stated by Dr. Storer, in an address read before the American Academy of Arts and Sciences, that these habits among the women in Massachusetts are so prevalent that the birth-rate among the native women is far below that of the death-rate ; that "the immense proportion of living births to the pregnancies in the foreign as compared with the native

and Protestant population is to be explained by the watchful protection exercised by the Catholic Church over foetal life. However we may regard the dogma on which this rests—the sanctity of infant baptism—there can be no question that it has saved to the world millions of human lives.” The argument results, that in a comparatively short period of time the old Puritan stock will disappear, and the population become Catholic. The confessional may also exert a conservative effect in this regard.

It is not my province in this paper to speak of legal enactments against such misdemeanors. Of course there could be no legislating against using means to prevent conception, but the laws already in force against producing abortion might be made more definite and stringent. It seems to be a prevalent opinion, not only among the people, but with some jurists and legislators, that the production of abortion does not constitute a crime unless committed after what is termed viability of the embryo, which is regarded as being the middle of pregnancy. The minds of the people should be disabused of this fallacy, and a higher moral sentiment in this particular inculcated; for it is evident to the minds of all physiological students that as soon as fetation is established the life of a new being is commenced, and its destruction at any time should be regarded as a crime of great moral magnitude, and punished accordingly. It would be well to heed the admirable sentiment of Percival, who says: “To extinguish the first spark of life is a crime of the same nature, both against our Maker and society, as to destroy an infant, a child, or a man.” In his investigations Dr. Storer learned that abortions were more prevalent in Massachusetts than in any other State, or in Europe; and further remarks, “that the statistics of that State show that from 1850 to 1855 the frequency of abortion, as compared with the still-births at the full time, was at least eight times as great as in the worst statistics of the city of New York.”

The mode of dressing among fashionable women also tends very greatly to impair the general health. I allude to tight lacing, deficiency of clothing in cold weather, thin shoes, etc. In a word, it might be said that a woman who holds strictly to the tenets of fashionable life is incapacitated from bearing and rearing healthy children. I only speak of these matters

as a cause of weakly constitutions in children without referring to any constitutional taint or disease a child may inherit, as the consideration of diseased children is not within the province of this paper.

Before speaking of the management of infancy I will give some statistics of its mortality. Of all children who die under five years old, 61.41 per cent die before they are one year old.* This is a shocking fact that should strike every thinking medical mind, and cause the sanitarian to be diligent in the use of every means possible to mitigate such a dire calamity. I have grouped the mortality reports of childhood in six Northern States—to wit: Maine, Massachusetts, Michigan, Minnesota, Nebraska, and New Hampshire, which show a mortality of 57.30 per cent of those who die under five years of age. In the States of Mississippi, Louisiana, Kentucky, South Carolina, Tennessee, and North Carolina the per cent of mortality is 56. These statistics do not embrace the large cities of those States, the mortality of which goes to increase the general death-rate. In grouping the cities of Boston, Cambridge, Fall River, Lawrence, Lowell, Lynn, New Haven, and Providence, we have a mortality of 62.37 per cent, while the combined mortality of Charleston and New Orleans amounts to 70 per cent of all the children who die before the age of five years. I classed the several Northern and Southern States separately in order to make a comparison of the mortality of infancy in the two sections of our country, which shows a very slight difference in favor of the Southern States. These statistics furnish strong presumptive evidence that malaria has no great influence in destroying infantile life, at least during the first year.

The most prominent diseases causing such terrible mortality are diarrhœa, dysentery, cholera infantum, diphtheria, whooping-cough, measles, and scarlet-fever. In the North bronchitis and pneumonia destroy a great many infants, while diseases connected with the nervous system are more prevalent in the South. *A priori*, one would suppose that bowel affections would be more prevalent and fatal in the South than in the North, but if we compare the statistics of the cities of New

* See Mortuary Report, census U. S., 1880.

Orleans and Charleston with eight of the largest in the North, including New York, Brooklyn, etc., we find, according to population, there is over thirty per cent difference in favor of the South. But in the country, outside of large cities, there is but little difference.

From the statistics furnished by the census report of 1880, which, of course, are the best obtainable, we can make only a proximate estimate of the mortality of the various diseases incident to childhood. We have recorded under the head of nervous diseases, for instance, inflammation of the brain, meningitis, apoplexy, paralysis, tetanus, and trismus, epilepsy, convulsions, mental diseases, and diseases of the brain. This is mixing things badly. We also have thousands of cases reported as debility, and a great many as dying from dentition. Now, I have always been incredulous respecting dentition as causing death. However, it may produce some reflex trouble which possibly might terminate fatally.

In the eight large cities above alluded to there was reported for the year 1880, 4960 deaths, due to premature labor and still-birth. This is a large mortality for a population of 2,600,000 from these causes, and no doubt there were many cases not reported. The cases reported as dying from debility were, no doubt, due in a great measure to parental impaired health and bad nursing. Very probably, from a correct report of all the cases returned as being due to premature labor, still-birth, and debility, it would appear that syphilis played a very active part in the production of this great mortality. Why I think so, is the fact that only 109 cases are put down to venereal diseases, when, in a single year, one large lying-in hospital will furnish more cases of mortality from that disease.

Other countries besides our own suffer great mortality among the infant population. F. Ecklund,* of Stockholm, in his "Inquiry into the causes of great infant mortality in the Norseland," states that according to the statistics of Europe 20 per cent of the children born die before they are a year old. In some European countries the death-rate of infants under one year runs very high as compared to the total mortality: In England, 24.8 per cent; in Switzerland, 26.2; in Saxony,

* See translation in *Southwestern Medical Gazette*, January and March, 1887.

30.8; in Holland, 31.1; in Wurtemberg, 44.8; and in the following cities in 1872—Paris, 30.8; St. Petersburg, 32.5; Turin, 32.9; Prague, 32.8; Marseilles, 35.3; Naples, 36.4; Brussels, 40.2; Moscow, 40.4; Vienna, 42.8; Stockholm, 40.1; London, 43.5; Dresden, 46.3; Bremen, 47.5; Hamburg, 48.4; Trieste, 49.4; Rotterdam, 53.6; Stuttgart, 56.4; Berlin, 58.1, and Rome, 40.4. Oestenler calculates the mortality of infants in all Europe to be 25.4 per cent of all deaths.

Ecklund makes a great difference in the longevity of legitimate and illegitimate children, giving the death-rate of the former at 21.8, and the latter 33.5 under one year, of all born. He attributes the difference to bad nursing and bad treatment generally. If there are any statistics bearing on this subject in this country I have been unable to find them.

Now, after considering the great mortality of infancy, the question arises, What can we do as sanitarians and medical men to modify or curtail it? Can we do anything? The solution of these questions consists mainly in the proper management of the first year of life. Much attention should be given in selecting a proper location for a residence. The house should be built on elevated ground, where due drainage can be effected, and where the soil is such as not to retain moisture near the surface. Dr. Parkes says a gravelly hillock is the most healthy. The house should be well ventilated, with a temperature between 70° and 80° F. Especially should this be the case in extreme infancy, as no doubt many infants have been lost on account of low temperature. One case came under the observation of the writer. An infant, as soon as born, should be well wrapped in a blanket previously warmed, and allowed to remain so until the room is thoroughly warmed and everything made ready for washing and dressing, which should be done as soon as practicable by the fire or stove, and then placed in bed close to the side of the mother. Precautions of this kind will save the child from the effects of cold on its air-passages, and may also save its life. The room where the mother and infant dwell should be commodious, and preferably in the winter with windows looking toward the south. The ventilation is best made at the top of the windows and draught avoided. Open fireplaces, grates, and Franklin stoves are regarded as being more healthful than tight stoves. The

moisture of the atmosphere of the room should be noticed. If a cellar is under the house it should be kept perfectly dry, and no vegetable matter allowed to remain in it in a state of decay. Dampness under or around the sleeping apartment is regarded as very deleterious to health. In cities care should be exercised in keeping out all noxious gases. Many times the atmosphere of a room may be contaminated by deleterious gas, which is only evident to the sense of smell. It is said that one of man's greatest enemies is his own breath; this being the case, it is essential that we should have sufficient breathing room as well as ventilation. A man exhales a half cubic foot of carbonic acid per hour. A single gas-burner liberates five cubic feet in the same time, being equal to ten men. A fire burning in a grate emits some impure gases, and abstracts from the air of the room as much oxygen as twelve men.* Thus it will be seen how essential it is to have a family room well ventilated. In close rooms it would be well to have the windows open both at the bottom and the top, say one inch for each occupant. Many diseases result from breathing impure air, one of the most common of which is consumption. In malarious districts it is advisable to sleep in upper apartments. In this way noxious exhalations which linger near the earth's surface may be avoided. The management of infants the first month is very important; during this time the mother is unable to give her child due attention. The care of it should be committed to a nurse of judgment and experience, one who knows how to wash and dress the child properly. It should not be kept too long at a time from its mother's breast, but allowed to nurse as often as every two or three hours. The mother, in the mean time, must have nourishing and digestible food. In fashionable life of modern times it has become, lamentably, of too frequent occurrence that mothers, as soon as their children are born, turn them over to the "nursery" and outside nurses, either wet or dry. In the latter case, of course, it takes the bottle, which, perhaps, after all, is nearly as good as a majority of the wet nurses, who frequently have children of their own who no doubt in many cases get the larger portion of milk, while the

* Parkes' Practical Hygiene, I, *ibid.*

motherless mite goes hungry. I have always thought that a mother who could be so heartless as to turn over her child to the tender mercies of a stranger to be nursed was devoid of proper maternal instincts, and committed a crime against true womanhood, if not unintentional infanticide. Civilization has, it would seem, developed some evils as well as many enjoyments.

The most important things to be observed in the management of infancy are food and manner of feeding, clothing, temperature, and cleanliness. Of course there are many minor things to be considered, such as proper handling, pure air, etc. All agree that the mother's milk is the proper diet for an infant when in good health, and next to this cow's milk. Quite a difference of opinion prevails as to how much the latter should be diluted with water. William Berry, M. R. C. S.,* says, add three parts water to one of milk; boil, and add a teaspoonful of sugar of milk with two pieces of loaf sugar and a little salt to a pint.

Dr. Benson Baker says, mix equal parts and add sugar of milk a teaspoonful, two grains phosphate of lime with two teaspoonfuls of cream. He regards this mixture as closely simulating mother's milk. Mr. Edmund Owens says cow's milk should be mixed with an equal quantity of warm water, with a little sugar and salt. Dr. Meigs's food for infants consists of two parts of cream, one of milk, two of lime-water, and three of a solution of sugar of milk of the strength of seventeen and three fourths drams to the pint of water.

Dr. Thurston thinks the use of the farinaceous substances not objectionable in connection with milk. He says they are superior to lime-water, barley gruel, etc., to prevent formation of firm curds. Professor J. Lewis Smith says, mix one part of milk with three parts of water up to third week; from the third week to the sixth, one part milk to two parts water; from the sixth week to the third month, half of each; at four and a half months, three parts milk and two parts water; at six months, three parts milk and one part water; after six months, one fourth water may be still added. He advises the water to be boiled and a little lime-water added to neutralize

* *Liverpool Medico-Chirurgical Journal.*

acidity, with a little salt. He thinks it is better to obtain milk from cows promiscuously than to be confined to one cow.

Dr. Sperry, of Wisconsin,* dilutes the milk with barley-water, one third milk to two thirds barley-water, for a child under three months, and so on, according to age. He says this mixture closely resembles mother's milk, and that infants thrive on it. He also adds a tablespoonful of milk sugar to the pint. Dr. Taaffe also advises one third milk to two thirds water under three months; from three to six months, half of each, and after six months two thirds milk to one third water to nine months, and then milk alone. Some say boil the milk, and others say boil the diluent. Most all advise addition of sugar of milk with a little salt, and if necessary, on litmus test, add sub. carb. soda or lime-water. Of course all advise fresh milk. If a comparison of the analysis of mother's milk and that of the cow is made, it will be found there is but little difference in the various constituent elements of the two. Water is in excess in mother's milk thirteen parts in one thousand; caseine nearly seven parts, and salts and inorganic matter thirty-one; while butter and oil are in excess 1.47, sugar and extractives 19.85 in cow's milk; thus showing a proportion of nutritive or assimilative matter to the water as a little more than one to seven for mother's milk, and one to 6.3 for cow's milk. The analysis of mother's milk, as above referred to, was made by Dr. N. S. Davis,† taken from three different women, "one in the third month, one in the fourth month, and one in the seventh month of lactation, gave a mean composition in one thousand parts: water, 878.07; caseine, 49.78; butter or oil, 35.53; sugar and extractives, 32.15; and salts or inorganic matter, 4.01."

Dr. Davis, as far back as 1856, contended that the bottle-fed children were starved by diluting their milk. It is reasonable to suppose that if an infant is deprived of its natural diet, and gets only one fourth or one third as much nutriment in an artificial one, it must suffer hunger and pass into a state of emaciation; and, should it be given the diluted food in quantity sufficient to compensate the loss in strength, its stomach

* *Journal American Medical Association*, October 30th, 1886.

† *Ibid.*, October 23d, 1886; *Transactions American Medical Association*, 1856.

will soon become distended with all the accompaniments of indigestion, and diarrhœa will follow.

It seems to be the general opinion, not only among the profession, but also among the laity, that woman's milk contains more sugar than cow's milk, hence the universal rule to add sugar to the latter. Another erroneous opinion obtains in regard to the amount of caseine in the latter being greater than in the former. This idea may have originated on account of its forming a much harder curd.

It is agreed by all that cows' milk, either in part or in whole, forms the best substitute for infant's food. There are a great many artificial foods for infants now on the market, and most of them either contain some of the elements of milk or are to be mixed with it when used. Some of these I have used with benefit.

Dr. Bamsch, of New York, speaks very highly of Carnrick's soluble food. He reports several cases treated successfully after diarrhœa had resulted from the use of other foods. In many instances, more particularly in towns and larger cities, it is with difficulty that fresh milk can be obtained, and a great deal of it is over a day old before the child gets it. By this time fermentation has commenced in a greater portion of it, hence the evil effects produced on the infant.

As the first month of infancy is the most delicate period with those who are fed artificially, a close supervision should be exercised over their digestive functions, and if any impairment occurs it should be immediately corrected. If a newborn infant sleeps well between meals we may be satisfied that it is digesting its food ; but, if it is wakeful and fretful, with distended bowels, its food is disagreeing with it, and it needs attention. When fed with largely diluted milk it may, from hunger, eat too much at a time and suffer from distended stomach. At such times the nurse is induced in many instances to give it some preparation of opium in order to quiet it, instead of changing the food. We must see that the food is sufficiently nourishing, and that it is properly digested. In cases where the mother is unable to nurse her infant, or does not afford sufficient supply, I am in the habit of giving cow's milk undiluted, taking care that fermentation is prevented. In order to avoid this with certainty, fresh milk should be

obtained, and special attention given to washing the bottles and tubes as soon as empty with warm water and soda. If it is found that indigestion results from formation of curd in the stomach, the milk should be boiled, or a little lime-water added. I have also had good results in this particular with the addition of fluid lactopeptine, and also with peptinoids.

It will always be found that the child will be satisfied with a much less quantity in bulk when the milk is given undiluted, and the danger from distended stomach is avoided.

Any means which can be used as prophylaxis against the occurrence of affections of the stomach and bowels, which are the great bane of childhood, will prove a godsend in the salvation of infant life. These affections—to wit, cholera infantum, diarrhœa, etc., are mainly due to improper feeding and high solar temperature. The question here arises, What can be done to alleviate a child from the deleterious effects of excessive solar heat? It now behooves us to be more careful than ever about the child's food, so as to prevent disorder of the stomach and bowels from that cause. Of late years river and lake excursions have been inaugurated in order to get the benefit of a breeze produced by the motion of the vessel when the air is still. It is said this means has proved very salutary; but it is comparatively convenient only to a few children to take advantage of this means of sanitation.

It is a well-known fact that warm air in motion cools and vivifies one when greatly oppressed with heat, although it does not produce a lowering of the temperature. How grateful to our feelings, when almost overcome with heat and fatigue, is it to be fanned rapidly in the face? Now, could not this knowledge be utilized in the construction of large fans to be used in the room of the infant during the heat of the day? Of course it would be attended with some expense and labor; but these, when put in comparison with a child's life, have but little significance. The labor part might be abridged by the use of cheap machinery to keep the fans in motion. This would also be of great utility in the sick-room in hot weather. Any means by which we can tide the infant over its first year should be regarded as of momentous importance.

When an infant is taken out of bed to be dressed or washed,

the room should be thoroughly warmed to near its own temperature, or the babe taken close to the fire. In a word, an infant should never be allowed to get cold. Children born in cold weather should wear caps. This precaution will, in many instances, prevent the taking of cold, resulting in chronic discharges from the ears and nose. In case of inability or unwillingness of a mother to take charge of her infant, great caution should be observed in selecting a nurse ; if a wet one, it should be ascertained that she is healthy, that she is of good moral character, and possesses an amiable temper. The lives of many infants are sacrificed by the neglect and cruelty of nurses. Many times when the child cries on account of hunger the nurse will give it some opiate or alcoholic liquor to quiet it in order to obtain leisure time for herself. The habit of giving infants opiates or spirituous liquors every time they cry is a very pernicious one. It is almost impossible to have an infant properly cared for in every particular, independent of its mother's attention. The amount of clothing for an infant before it can sit alone is not so important, as it is kept in bed most of the time, but after that great care should be exercised in this regard, so that it will not be exposed to the variations of temperature. I have already alluded to the temperature of the lying-in room, and the care of keeping the child warm. It is very important that the infant should not be exposed to draughts of air. It should never be taken out in cold weather without being well protected by sufficient clothing. With proper precautions an infant should be washed all over once a week in winter and oftener in warm weather. It is said that "a clean and ruddy skin shuts the gate to many diseases." The position of a young child should be attended to. In its first months the bones of the head are not sufficiently united to hold the brain in its proper shape, and if the child is allowed to remain too long in one position the head may become flattened, or larger on one side than the other. Its position, on this account, should be changed every time it nurses.

After children are over one year old they do not need such close observation on the part of parents or nurses, especially as it respects diet and feeding, the main things now being proper clothing, cleanliness, and protection from harm. When they arrive at school age it should be seen that they are not

pushed in their studies too rapidly. They should not be confined too long at a time at their lessons, but allowed to take due amount of exercise. Close confinement and what is called cramming have undermined and ruined the health of many children. This plan, no doubt, has paved the way for many cases of nervous disease. The school-room should be sufficiently large to afford ample breathing room for its inmates, and be well ventilated. The light should not be so glaring or brilliant as to unduly contract the pupil, or so dim as to unnaturally dilate it. Owing to these causes many imperfect eyes are engendered. It is specially so in regard to myopia, due to insufficient light. In some schools half the children have been found to suffer from myopic eyes. The seats should be so arranged as to afford support to the back. In the country a great many school-houses are supplied with mere benches without backs, thus keeping small children humped up six or eight hours a day, which may produce spinal trouble or deformity.

Children should be encouraged to take a certain amount of exercise daily, but not allowed to carry it to excess. In the more active forms of muscular exercise injury may result from protracted exertion. Heart troubles have resulted from jumping the rope and from what is termed prisoner's base, etc., when protracted for too long a time. After the exercise is over the boys should put on their coats before cooling off, and not sit in the draught of air.

Contagious Diseases.—Prophylaxis should be used as much as possible to avoid the spread of contagious diseases. Every child before it is a year old should be vaccinated, and at any subsequent period, should the community be threatened with small-pox, revaccinated. Should measles or whooping-cough appear in a neighborhood, especially in the fall or winter months, isolation should be rigidly enforced. It is in cold weather that these diseases prove so disastrous to childhood. Scarlet-fever and diphtheria being of epidemic origin, we must ascertain the cause and remove it, and not allow intercourse of sick with well children.

My chief object in writing this paper is to call the attention of physicians more particularly to the management of infancy during the first year, and at the same time to impress them with the necessity of instructing their *clientele* to be more

diligent in watching the effects of food on the digestive apparatus. I think it is in the power of every physician to save one or more lives of infants annually by the exercise of a careful supervision of this character, and this would add one hundred thousand to the population of our country every year.—*American Practitioner and News.*

AMERICAN CLIMATOLOGICAL ASSOCIATION.

FIFTH ANNUAL MEETING, WASHINGTON, D.C., SEPTEMBER
18TH-20TH, 1888.

Professor A. L. LOOMIS, M.D., of New York, President.

ABSTRACT OF PROCEEDINGS.*

PRESIDENT'S ADDRESS.

THE profession has been stimulated by the work of this society in climatology. The climatology of old age will chiefly be considered in the address. The body declines, while the mind keeps its vigor much longer, and therefore, if the body be properly taken care of, much mental work may be done, and often of a high order. An important hygienic law is, that the brain be stimulated by pleasurable occupation; also proper food and plenty of fresh air should be available; but it is important that the extremes of temperature, either of heat or cold, should be avoided. The ancients paid great attention to the hygiene of old age. Certain rules should be observed in choosing a climate for old persons. 1. Healthy old age is best passed in moderately warm climates; changes, however, are of advantage, and it is not necessary that old persons should always remain in one locality. 2. They should live in a climate where a great part of the time can be spent out-of-doors. 3. Well-cooked food is of great importance to the aged; it should be simple and easily digested.

* For which THE SANITARIAN is under obligations to the *Medical Record* for report.

Diseases occurring at other times of life may present special characteristics in old age, and we have also diseases, due to degeneration of tissue, peculiar to this time of life. We must consider these facts in choosing a climate for old age. High altitudes are not usually safe for the aged, and it is never safe for them to pass suddenly from a low to a high altitude when they are suffering with phthisis pulmonalis. Localities like Nassau, Cape May, or Newport are advantageous in such cases. Changes of climate are also a prophylaxis against the development of phthisis, and this should be more fully recognized than it is. A person recovering from an acute attack of pulmonary trouble may sometimes escape the development of phthisis by a timely change of climate. Gout and rheumatism, so common to the old, may often be avoided by a trip to California or Florida. Cystitis is often aggravated by a cold, damp climate and is benefited by a change to a warmer climate.

Dr. S. A. FISK, of Denver, read a paper on

A STUDY OF THE CLIMATE OF COLORADO AS APPLIED TO
THE ARREST AND CURE OF PULMONARY DISEASE.

So many cases of the cure or arrest of disease have come under observation that he cannot refrain from making some statements on the subject. On account of there being no large bodies of water on the eastern side of the mountains in Colorado, and the drainage being mostly subterranean, the climate is extremely dry; the elevation of the region resorted to by invalids varies between three thousand and eight thousand feet or more, so that the elevation may be regulated by the needs of the patient. The effects of elevation, of the small amount of humidity, of the large number of sunshiny days, in Colorado, were dwelt upon at length. In the winter months the variations in temperature are extreme, and in certain situations in the summer the heat is often great.

The velocity of wind in Denver, contrary to the frequently received opinion, is not often very great; and in this Denver will compare favorably with the Connecticut Valley. The dust-storms are at times, however, sufficiently severe to be detrimental to invalids if exposed to them. Fogs are almost unknown. He questions if elevation is any assurance of the

absence of germ-life. Putrefaction and decay may be found where other appropriate conditions are present, anywhere in Colorado.

Dr. S. E. SOLLY, of Colorado Springs, read a paper on

INVALIDS SUITED FOR TREATMENT AT COLORADO SPRINGS.

The situation, area, population, and excellent drainage of Colorado Springs were spoken of. The effects of the elevation on the skin, the circulation, the respiration, the digestion, the nervous and muscular systems, were considered. He mentions the danger of elevation in cases of fatty degeneration of the heart muscle.

In persons under thirty years of age, with dilatation of the heart, the greatest caution should be used to live carefully and not to take too much or too violent exercise. When the heart is normal, although its action is at first increased, after a time it invariably returns to its normal condition. He recommends the place for arresting threatened tuberculosis; fibroid phthisis also does well. Renal complications make the change to Colorado risky. Moderate dilatation of the heart in the young is not a positive contraindication.

Dr. R. G. CURTIN, of Philadelphia, read a paper entitled

IS CLIMATE AN ETIOLOGICAL FACTOR IN GRAVES' DISEASE?

He has tabulated over seventy cases, and has studied the subject for twenty years. He found forty cases in fifteen families, and after carefully investigating has concluded that the disease is hereditary. A large proportion of his cases came from Alsace and Lorraine, and he thinks that elevation has an influence on the development of the disease, which might otherwise have remained quiescent, and he believes he has seen instances of this among persons residing in the Alleghany Mountains.

Dr. GEDDINGS mentioned a case of goitre which became severe when taken to a considerable elevation.

Dr. FISK remarked that the cases he has seen do not lead him to think that elevation is injurious to goitre.

Dr. P. H. KRETZSCHMAR, of Brooklyn, read a paper on

HEALTH-RESORTS *versus* INSTITUTIONS FOR THE TREATMENT OF PULMONARY CONSUMPTION.

We are far behind Europe in this matter. We have not utilized our mineral springs as we could do, considering the number and value of those we have. He strongly advocates the advantages of sanitariums where a careful supervision can be had over the patients. He considered somewhat fully the *régime* adopted in various institutions and the imprudences indulged in at health-resorts.

Dr. LOOMIS said that he did not believe that health-resorts were of much benefit to consumptives unless they were under the care of a competent physician. All his patients that are sent to the Adirondacks are obliged to give themselves up entirely into the hands of their physicians.

Dr. SOLLY considered the regulation of the daily life of the patient as the most important part of the treatment, but opposes collecting a large number of patients together.

Second Day.—Dr. E. T. BRUEN, of Philadelphia, opened the discussion on

THE RELATIVE IMPORTANCE OF DIFFERENT CLIMATIC ELEMENTS IN THE TREATMENT OF PHTHISIS.

Exact statistics on this subject are still wanting, and it is difficult to decide on the relative importance of different climatic elements. Those elements are most important which fortify the body against disease. In disseminated forms of tuberculosis the climatic treatment is often of benefit. No one climate is beneficial to all cases; some improve most on the sea-shore, others most in the mountains. Sunshine, however, is always beneficial, and overcrowding should be avoided. Sunshine, plenty of fresh air, and purity of the atmosphere are the important elements in climate for the treatment of phthysical cases. Porosity of soil is of more importance than dryness of the atmosphere; in fact, the latter usually accompanies the former. Equability is not always of importance, as many cases do well where there are sudden changes of temperature. Pure air, abundance of ozone, absence of dust are important, but rarity is not always beneficial, and sometimes positively harmful. The value of rarity of the atmosphere has been overestimated.

Dr. V. Y. BOWDITCH, of Boston, continued the discussion. The word phthisis covers a variety of diseases, and this is the cause of considerable confusion upon this subject. Elevation and dryness of soil and of atmosphere are important elements in the treatment of incipient phthisis according to most authors. He questions if the value of elevation has not been overestimated. The importance of sunshine, pureness of air, and dryness are too evident to need discussion, and although some cases do well in moist climates, it is the exception. Sea voyages, however, are often beneficial. He recommends the establishment of sanitariums in proper localities.

Dr. F. I. KNIGHT, of Boston, read a paper on

INDICATIONS AND CONTRAINDICATIONS FOR ALTITUDE IN THE
TREATMENT OF PHTHISIS.

An out-door life in a pure air is the most important thing in the treatment of these cases. He discusses the residence of such patients at altitudes of from four thousand to six thousand five hundred feet. He thinks such altitudes are not suited to patients over fifty years of age, nor for patients of a neurotic temperament. In many cases where quiescence in the morbid processes exists, high altitudes are beneficial. Patients with large cavities or hectic symptoms should not be sent to high altitudes. Cardiac dilatation, and in most cases hypertrophy, contraindicate high altitudes; murmurs, however, are not always contraindications. Some persons with excessive bronchial irritability do better at low levels.

Dr. W. A. JAYNE, of Georgetown, Col., read a paper on

THE CLIMATE OF COLORADO.

There is an exceptional combination in the climate of Colorado of those elements which enable those living there to spend most of the time in the open air. Those first coming there usually experience increased action of the heart and sleeplessness and nervousness; but these symptoms usually pass off in a short time. Sometimes faintness is also experienced. While the value of the purity of the atmosphere cannot be overestimated, he attributes its chief value to the rarefaction.

Dr. SOLLY opened the discussion on the subject of *

ALTITUDE AND CLIMATIC CONDITIONS IN THE TREATMENT
OF CONSUMPTION.

He disagreed with Dr. Bruen that altitude was of little value comparatively in the treatment of phthisis. He thinks where there is lack of chest expansion altitude is most beneficial. He does not think active conditions, ulcerations, and hectic are always a contraindication. He has seen cases of ulceration in laryngeal phthisis which have healed in Colorado.

Dr. DENNISON, of Denver, thinks that altitude is an important element in treatment of phthisis, not only on account of the rarity of the air, but also on account of the cold. The cold air, breathed into the lungs and raised to the temperature of the body, has a mechanical action in the expansion of the lungs.

Dr. KRETZSCHMAR, of Brooklyn, thinks that altitude has considerable influence on the development of phthisis. He believes in out-of-door life, but rather in rest than in exercise out-of-doors.

Dr. FISK, of Denver, spoke of the value of sunshine, and said that a greater percentage is usually found at high altitudes than at low levels. He insists upon a long residence in high altitudes.

Dr. W. T. FORD, of Utica, thought that altitude was not an important element in the treatment of phthisis, but that pureness and dryness of air and out-door life are the important elements.

Dr. TAYLOR, of San Antonio, Tex., thought that altitude was not, but that dryness was, an important element. He instanced the number of cases benefited by residence in Texas at an elevation not exceeding two thousand feet.

Dr. BRUEN, in closing the discussion, said that he did not deny the value of the mechanical aids of a high altitude in certain cases, but what he wished to emphasize was that many cases were not proper ones for the high-altitude treatment.

Dr. W. T. FORD, of Utica, read a paper on

AN EPIDEMIC OF CEREBRO-SPINAL MENINGITIS IN CENTRAL
NEW YORK.

He instanced several epidemics which seemed, when they came on, to take the place of other inflammatory diseases pre-

vailing at the time. The inferences drawn from nine epidemics were that damp, wet weather and insanitary conditions favored the epidemic, and that dry weather, either cold or warm, was unfavorable to its development.

Dr. E. TRUDEAU, of Saranac Lake, sent a communication entitled

AN ENVIRONMENT EXPERIMENT REPEATED,

which was read by Dr. A. L. LOOMIS. Former experiments of inoculating rabbits in the lungs with pure culture of the bacillus were repeated. Of six rabbits two failed to become infected, and in two the lesions were only local. From a comparison of these and former experiments, it would seem that the amount of virus injected at one time has a considerable influence on the result. He draws the conclusion from his experiments that the best prospect of success in the treatment of phthisical cases lies in placing them in a condition of favorable environment.

Dr. SANSOM, of London, thought that we may now consider the bacillus as the cause of tuberculosis. He believes that tubercular lesions are sometimes curable, as, for example, tubercular meningitis. He believes the danger in such cases lies not so much in the presence of bacilli as in the presence of septicæmia, which is so apt to be present.

Dr. WILLIAMS, of New York, suggested that the difference in virulence of cases, not only of tuberculosis, but of cholera and other infectious diseases, may depend upon some difference in the germs themselves, and that some experiments should be made with reference to this point.

Dr. C. C. RICE, of New York, presented the

REPORT OF THE COMMITTEE ON MINERAL SPRINGS.

An attempt was made to make some classification of the mineral springs with reference to their therapeutic results. Over eight hundred letters were sent out to the different springs. The answers, in the majority of cases, were unsatisfactory, often unscientific, and answered by hotel-keepers or owners of the springs. Tables were given of the uses and the mode of using the waters. To obtain more satisfactory results, it is recommended that a committee of two persons in each State

be formed, and that further investigations be carried on. As an indication of the work to be done, it may be stated that nine tenths of the mineral waters of the United States are still unanalyzed.

Dr. WILLIAM PEPPER, of Philadelphia, opened the discussion with remarks on the

THERAPEUTIC VALUE OF MINERAL WATERS IN GASTRO- HEPATIC DISEASES.

This country is richer than any other country in mineral springs, but the reliable analyses of these springs are very few. He emphasized their value in removing effete material in these diseases. Gastric atony, catarrh, dilatation, congestion of liver, gall-stones, abdominal engorgement are all benefited by their use. It is important to consider the time and mode of administration. The diet and the exercise to be taken during their administration are extremely important; he recommends when to be given with the water treatment.

Dr. A. H. SMITH, of New York, made some remarks on

THE USE OF MINERAL WATERS IN URINARY AND ARTHRITIC DISEASES.

Those waters containing the least amount of mineral matter are the ones most beneficial—examples of which are the Gettysburg water and Clysmic. The frequent use of mineral waters containing much solid matter by persons in health irritates the kidneys and may even produce disease.

Dr. W. C. VAN BIBBER, of Baltimore, made remarks on

MINERAL WATERS IN MALARIAL DISEASES.

He recommended the water of the Greenbrier White Sulphur Springs, to be used from two to four weeks. Two to four glasses should be taken before breakfast; a bath in the middle of the day with a couple more glasses of water, two more in the afternoon, and two more before retiring. He has seen most excellent results. He also recommends some of the Saratoga springs for cases of chronic malaria.

Third Day.—Dr. J. T. WHITTAKER, of Cincinnati, read a paper on

CONDITIONS WHICH TEND TO RENDER THE ATMOSPHERE OF
A LOCALITY ASEPTIC.

He reviewed the opinions of authors as to the agency which the air has in carrying the germs of disease. The air of different localities varies a great deal in the number of micro-organisms, the air of cities containing more than that of the country. The air at sea, at the distance of a little over a hundred miles, is absolutely free from micro-organisms except in the presence of a land breeze. The large number of micro-organisms found in dwelling-houses would lead us to infer that infectious diseases are usually, if not always, contracted in dwelling-houses. The conditions necessary to make the air in a house aseptic were considered. He recommended furnaces which should take their air from the top of the house.

Dr. JOHNSON, of Chicago, remarked that one of the difficulties of producing an aseptic atmosphere is, that what will destroy one micro-organism will not destroy another. He spoke of the danger of large numbers of micro-organisms found in health-resorts.

Dr. TAYLOR, of San Antonio, spoke of the prevalence of septic diseases in localities where people are shut up in their houses for a great part of the year.

Dr. DALY, of Pittsburg, doubts if it is best to take the air for furnaces from the tops of houses. He considered the house described by Dr. Whittaker was an ideal house which could never be built, but he recommended the careful examination of houses as they exist.

Dr. WILSON, of Philadelphia, said that dilution was the true means of rendering the air of our houses aseptic. There is more apathy than there should be about the ravages of pulmonary consumption, which are more formidable than even the epidemics of the Middle Ages, and we should take proper precautions against the spread of consumption.

Dr. A. H. SMITH, of New York, remarked that he believed the time would come when the physician who neglected to take proper precautions to prevent the infection of healthy

persons by consumptives would be considered as guilty as one who exposed his patient to the small-pox without vaccination.

Dr. FRANK BOSWORTH, of New York, made remarks on

THE RELATION OF THE NASAL AND NEUROTIC FACTORS IN
THE ETIOLOGY OF ASTHMA.

He does not believe in the spasmodic origin of asthmatic attacks. He believes that the disease is a neurosis, according to the theory of Weber. The serous exudation of the nasal and bronchial mucous membranes are reciprocal, the exudation of one adapting itself to the exudation of the other; anæmia of the one also being associated with anæmia of the other. On account of the sympathy between the two membranes, certain conditions of the nasal membrane may cause attacks of asthma.

Dr. E. L. SHURLY, of Detroit, spoke of a series of experiments on dogs to produce asthmatic paroxysms, and these led him to discard the spasmodic theory of asthma. He does not believe in the nasal origin of asthma. The majority of nasal passages of asthmatics that he has examined in the past four years he thinks have been healthy.

Dr. DALY, of Pittsburg, emphasized the difference in experimental researches on animals and the conditions of disease in human beings. He believes there are a certain number of cases of hay asthma which can be cured by placing the nasopharynx in a healthy condition, but this is not so in all cases.

Dr. A. H. SMITH, of New York, thinks the causation of asthma is a many-sided question. Not only the swelling of the mucous membrane, but interference with the circulation of the blood through the lungs, may have something to do with the asthmatic attack. The frequent good results of operations on the nose in such cases has much impressed him of late years.

Dr. BEVERLEY ROBINSON, of New York, thinks that nasal disease may have a causative relation to asthma. He remarked, however, that he had seen many cases of nasal obstruction in those who had never had asthma.

Dr. BOSWORTH said that, of 80 of his cases of asthma, 42 had been cured and 30 much benefited by nasal treatment alone. In 5 of these cases the result was unknown, and only 3 were not benefited. He thinks this a strong argument in favor of the nasal cause of asthma.

Dr. J. L. WILSON, of Philadelphia, read a paper on

CLIMATE AND BRIGHT'S DISEASE.

Renal disease prevails most where the heat for the greater part of the year might be called temperate. Change of climate in chronic Bright's disease is of great value, and is, perhaps, as important as in consumption. Little notice is taken in text-books of the change of climate. The dangers of abrupt changes of climate or of long journeys by rail must not be overlooked.

Dr. TAYLOR, of San Antonio, emphasized the value of change of climate in Bright's disease in going from the Northern to the Southern part of the United States.

Dr. SOLLY, of Colorado Springs, said sending cases of Bright's disease to high altitudes was usually dangerous, but he had seen cases do well in Colorado. He believes the chief point to be thought of is the action of the skin and the effect the climate will have upon that.

Dr. LOOMIS remarked that his advising change or not in these cases has depended upon the condition of the heart; when we have signs of heart failure we are risking the lives of our patients by sending them away.

Dr. M. K. TAYLOR, U. S. A., read a paper on

CLIMATIC CHARACTERISTICS OF TEXAS.

It is impossible, within the limits allowed, to do justice to so large an area of country as Texas. The rainfalls and the elevation of different parts of the State were dwelt upon. He mentioned the dryness of the air in some sections, which equals that of the Nile region. The average number of days in which the thermometer goes below zero at San Antonio is fourteen in the year, and there is rarely any dew.

Dr. J. J. LEVICH, of Philadelphia, read a paper on

WEAK HEARTS AS AFFECTED BY CLIMATE AND TEMPERATURE.

He believes the strain brought upon the heart by severe exercise may produce effects which last often for a long time, and this condition he calls, for want of a better name, weak heart. After considering the symptoms he insists upon the importance of recognizing the condition early. The most important part of the treatment is to avoid the cause, and change of climate. He recommends small doses of *nux vomica*. Although *digitalis* in proper cases is valuable, he says a word of caution against its improper use ; it is not well to give it in these cases.

Dr. A. L. LOOMIS remarked that there were cases of heart failure for which there is apparently no cause, but he believes that in most of these cases there is dilatation, most frequently of the right side, and this dilatation is not necessarily permanent.

Dr. J. M. ANDERS, of Philadelphia, read a paper on

TEMPERATURE AND RELATIVE HUMIDITY, AND THEIR RELATIONS TO HEALTH AND DISEASE.

He drew a number of conclusions upon the subject of his paper.

Dr. I. H. PLATT, of Lakewood, N. J., read a paper on

SUGGESTIONS REGARDING THE MANAGEMENT OF PHTHISICAL PATIENTS UNDERGOING CLIMATIC TREATMENT.

The benefits of climatic treatment depend, first, upon choosing the proper climate, and, second, upon the proper regulation of the life. He considered what we should seek for in change of climate and the mode of life to be adopted by the patients wherever they may be sent. He deprecates the association of a large number of patients together. He considered the construction of the houses in which patients should live.

Dr. W. MATTHEWS, U. S. A., read a paper entitled

FURTHER CONTRIBUTIONS TO THE STUDY OF CONSUMPTION AMONG THE INDIANS.

The rate of consumption, especially *scrofulous*, among Indians is high and is increasing, which may be accounted for by the

change of life among those who have given up their wild life and are living on reservations. Scrofula is common among these people.

Dr. D. M. CAMMANN, of New York, read a paper on

OBSERVATIONS ON THE USE OF TEREBENE.

He found terebene useful in bronchial affections. It lessened the expectoration and rendered it more watery. It seldom disordered the stomach. It was found to be more useful in cases of emphysema and bronchitis than in cases of phthisis. It is diuretic as well as expectorant, relieves flatulence, and seems to have a resolvent action on pleuritic adhesions.

The association then adjourned.

THE MEDALS, JETONS, AND TOKENS ILLUSTRATIVE OF SANITATION.

By Dr. HORATIO R. STORER, Newport, R. I., Member of American Public Health Association, etc.

X. *Epidemics.* Continued from page 160.

I. GENERALLY CONSIDERED.

I HAVE already incidentally described many medals relative to the causes of zymotic disease. Such are Nos. 282-347, commemorative of the drainage of marshes and the construction of canals, and others of famine (Nos. 401-696), etc.

A. THE UNITED STATES.

Dr. H. I. Bowditch, of Boston. "Is consumption ever contagious or communicated by one person to another in any manner?" Boston, 1864, 8°.

Report of the Committee on Climatology and Epidemics in Massachusetts, 1868-69. *Trans. Am. Med. Ass'n.*; also Philadelphia, 1869.

Dr. Bowditch has already been mentioned under Sections I., V., and XII.

I shall hereafter describe a medal of the Consumption Hospital at Brompton.

Dr. N. S. Davis, of Chicago. "Contagious and Infectious Diseases." *Trans. Am. Med. Ass'n*, xxiv., pp. 159-68.

Dr. Davis has already been referred to in Section VIII.

Dr. David Hosack, of New York. "Observations on the laws governing the communication of contagious diseases, and the means of arresting their progress." New York, 1815, 4°, pp. 84.

"Observations on febrile contagion," etc. New York 1820, 8°.

Dr. Hosack's medal has been described under Section I.

B. ENGLAND.

John Howard. So much was done by Howard toward preventing local epidemics in prisons and their neighborhood, that his name should be mentioned here. His medals were described under Section I., and he will be immediately referred to again in connection with The Plague. When speaking of Howard before, I described one medal (No. 56) and no less than twenty-five tokens (Nos. 31-55) that had been struck in his honor—a very much larger number than had been previously supposed to exist. I have since discovered two others, making the twenty-sixth and twenty-seventh. They are the following :

697. Obverse and reverse as No. 54, save 1795. Upon edge, We promise to pay the bearer one cent.

Coin Collectors' Journal, July, 1887, p. 108, Mule, No. 6.

The fourth of the American "Howards." Unknown to Rudolphi, Kluyskens, Duisburg, Neumann, and Rüppell.

698. Obverse, Iohn Howard F R S

Reverse. Unity And Peace. (There is no date.)

Low, Catalogue of United States and Colonial Coins, etc., 1885, No. 161. Unknown to Rudolphi, Kluyskens, Duisburg, Neumann, and Rüppell. This, the fifth of the American Howards, is one of the so-called "Pennsylvania Coppers." Even more than the preceding, it is an interesting and valuable addition to the American medical series.

Dr. Richard Mead, of London (1673-1754).

Pestilential Contagion, London, 1722, 8°.

699. Obverse. Draped bust, to right. Beneath shoulder, L.Pingo F. Inscription: Richardvs Mead, Med.Red.Et S.R.S.

Reverse. An infant, seated, holding a serpent by the throat. Above, the sun and moon, which intersect the legend. Legend: Labor Est Angves Svperare. Exergue: an armorial shield, upon either side of which, the month dates being to the left and the years to right, N(atus).Av(g).XI—MDCLXXIII | o(biit). F(eb).XVI—MDCCLIV. Bronze, tin. 26. 40 mm.

Rudolphi and Kluyskens have a comma after Mead, and, with Duisburg, they have Aug. and the dates in Arabic numerals. Durand has a dot after Est in his description, but not in his figure.

Rudolphi, 1829, p. 106, No. 441; Kluyskens, ii., p. 207; Renauldin, p. 491; Duisburg, p. 223, dxciii.; Durand, p. 126, pl. ix., No. 3.

In the Lee Collection. Dr. Lee has suggested to me that the device of the sun and moon upon the reverse was taken from a Greek coin of Crotona. If such is the case, it was doubtless in reference to Dr. Mead's great fame as a numismatist, and to his controversy regarding certain coins of Smyrna which he considered, probably erroneously, as commemorative of physicians. The added device of the child strangling a serpent is similarly suggestive of his own professional conflicts of opinion.

Dr. Thomas Sydenham (1624-89). Works of Epidemics, Plagues, etc.; Annotations by Geo. Wallis. Two vols. London, 1788, 8°.

700. Obverse. Bust to left, with flowing hair and bands. Beneath shoulder, Moltedo F. Inscription: Thomas Sydenham

Reverse. Natus | Westimenstri | In Anglia | An.M.DC.-XXIV. | Obiit | An.M.DC.LXXXIX. | — | Séries Numismatica | Universalis | Virorum Illustrium | — | M.DCCC.XXVI. | Durand Edidit On rim, Cuivre. Bronze. 42 mm.

Duisburg has the dates in Roman, as has Kluyskens also in his description.

Kluyskens, ii., p. 483, fig.; Duisburg, p. 217, dlxxix.

This medal was unknown to Rudolphi, although struck three years before the publication of his last edition.

Sydenham has been further commemorated by his name being placed in a conspicuous position upon one of the medals of Dr. Benjamin Rush, shortly to be described. He will be mentioned again in the subdivision of the present section upon Intermittent.

C. HOLLAND.

Pieter Van Foreest (1522-97). "De febribus grassantibus, cum morbis epidemiis," etc. Frankfurt A-M., 1602, fol.

701. Obverse. Bust to left. Beneath, Simon F. Inscription : Petrus Forestus.

Reverse. Natus Alcmar An.1522. Obiit An.1597. Silver, bronze. 45 mm.

Rudolphi describes the name of the engraver as at the left of the bust, while Kluyskens states that it is at the right.

Rudolphi, 1829, p. 55, No. 226 ; Kluyskens, i., p. 314 ; Duisburg, p. 178, cccclxxviii.

J. H. Van Swinden. He wrote upon the diseases of hospitals and their local causes.

His medal has already been described under Section I., and reference made to him besides under Sections II., V., and VI. He will again be mentioned under Section XV.

D. BELGIUM.

Peter Joseph Van Baveghem (1745-1805). "Verhandeling over de Koortsen in t'algemeen, dog .bezonder over de rot-koorts en roodeloop," etc. (Upon fevers in general, epidemic dysentery, and putrid fevers, intermittent and continued.) Three vols. Dendermonde, 1788-90, 8°.

702. Obverse. Bust, facing.

Reverse. Pierre—Joseph Van Baveghem, Né Le 2 Déc. 1745 An Marckgraeve—Leye—Lez—Anvers, Mourut A Baes-
rode Le 29 Janv.1805. Silver. 40 mm.

Kluyskens gives two conflicting descriptions of this medal. In his work of 1859 he has the months of birth and death in full, in that of 1884 he abbreviates them. In the first, he has Mark and Mort ; in the latter, as above, Marck and Mourut.

Kluyskens, ii., p. 521 ; *ibid.*, Num. Med. Belge, 1884, p. 15.

This medal was unknown to Duisburg and Rudolphi, but

like some of the others of the Low Countries, it conveys no intimation that it was in memory of an eminent physician.

E. FRANCE.

Dr. Jean Baptiste Nicolas Boyer, of Paris (1693-1768). "Methode à suivre dans le traitement des différents maladies épidémiques qui regnent le plus ordinairement dans la généralité de Paris." 1761-62, 12°.

703. Obverse. Bust; beneath, Du Vivier. Inscription: J.B. Boyer Reg. St. Mich. Ord. Equ. 1756.

Reverse. A temple, with serpent and plants. Legend: Monstrat Iter. Silver, copper.

Kluyskens has J. Duviv., an Eq. F. M. P. Dec. I therefore query if he has not confounded the present with one of the following jetons.

Wellenheim, ii., t. ii., p. 642, No. 13,309 (Friedländer MS.); Rudolphi, 1829, p. 26, no. 97; Kluyskens, i., p. 151, no. 1 (?); Duisburg, p. 87, ccxlviii., 1.

Though this belongs to the series of the Deans of the University of Paris, it is not in the Chéreau Collection. I therefore question if it may not be a mule with reverse of Ph. Hecquet, mentioned in the next subdivision, The Plague, No. 711. Rudolphi, however, affirmed that he saw it in the collection of Goetzius.

704. Kluyskens thinks that there is a variety of the above with only the initials of the engraver, with Eq. instead of Equ., and with also F. M. P. Dec., as in the following. This will very likely prove a second mule.

705. Obverse. Bust to right, with flowing wig and cross of his Order (St. Michael). Beneath, J Du Viv. Inscription: J.B. Boyer Reg. St.—Mich. Ord. Eq. F. M. P. Dec.—1756.

Reverse. The family arms; a crowned oval shield with lateral scrolls and olive branches, surrounded by a chain with the cross of St. Michael. Upon shield, an ox, to left; beneath, a star. Exergue: Iterum Decan. | 1758. Silver, gilt bronze. Edges milled. 18.

Neumann inserts a dot after Du. The last initial, N, of Boyer's Christian name is not given on his jetons. It is also omitted in the Index Catalogue of the Library of the U. S. Surgeon-General's Office.

Wellenheim, ii., t. ii., p. 642, No. 13,308 (Friedländer MS.) ; Rudolphi, 1829, p. 26, no. 98 ; Kluyskens, i., p. 151, No. 2 ; Duisburg, p. 87, ccxlviii., 2 ; Neumann, No. 31,286.

This is in my collection, from that of Dr. Chéreau. Rudolphi also had it, and Kluyskens.

706. Obverse. Bust and inscription as in preceding.

Reverse the same, save that instead of inscription and date, there are a crown with five stars and two sceptres upon a cushion. Silver.

Kluyskens, i., p. 151, No. 3 ; Duisburg, p. 87, ccxlviii., 3.

This is not in the Chéreau Collection, nor was it known to Rudolphi. It may be a mule of the obverse of the preceding, with reverse of one of the jetons of Dr. L. P. F. Le Thieullier (Dean in 1760-62), which had a crown with five stars and two sceptres and a cushion beneath his own coat-of-arms.

707. Obverse as preceding.

Reverse. Arms of the Faculty (three storks with sprigs of marjoram). Legend : Urbi et Orbi. 1756. Facul. Medic. Pari.

Duisburg omits the Facul., etc.

Wellenheim, ii., 2, no. 13, 308 ; Kluyskens, i., p. 151, No. 4 ; Duisburg, p. 87, ccxlviii., 4.

This is not in the Chéreau Collection. It was unknown to Rudolphi, and is very likely another mule.

Boyer will be again referred to in the subdivision of the present section upon The Plague.

Dr. Étienne Pariset (1770-1847). Wrote upon contagious diseases, especially yellow-fever.

708. Obverse. Bust, to left ; beneath, Gayvard F. Inscription : Étienne Pariset.

Reverse. An oak wreath ; within, the staff of Æsculapius. Inscription : A Étienne Pariset Ses Amis. Lead. 35 mm.

Kluyskens, ii., p. 395 ; Duisburg, p. 71, clxxxii., 2.

Pariset will shortly be referred to again, and other medals in his honor described.

Dr. Louis Pasteur, of Paris (1822-).

709. By Ringel ; issued by J. Ronam, 29 Cité d'Antin, Paris.

I have as yet failed to find its description.

Pasteur will be again referred to under the subdivision of Epizootics.

F. GERMANY.

Jakob Hofmann, of Heidelberg. "A dissertation on Endemial Diseases." London, 1746, 8°.

His medal has been described under Section IV., Mineral Springs.

G. RUSSIA.

Dr. Carl Ernst Von Baer, of St. Petersburg (1792-1876). "De morbis inter Esthonas endemicis" (Dorpat). 1814, 8°.

710. Obverse. Bust, to left ; beneath, in Russian, Techuk-masow P. Legend : Orsus Ab Ovo Hominem Homini Ostendit.

Reverse. In Memoriam Diei Qvo Abhinc Quinqvagina Annos Die XXIX Mensis Avgvsti A.MDCCCXIV Carolvs Ernestvs A Baer Ab Vniversitate Dorpatensi Medicinae Doctor Renvnciatvs Est. Bronze. 44.

Duisburg omits upon the reverse the name of the University, which I supply from the description kindly sent to me by Dr. Lee.

Berliner Blätter für Münz-, Siegel und Wappenkunde, Bd., iii., p. 117 ; Duisburg, Suppl. ii., 1868, p. 16.

In the Lee Collection.

II. THE PLAGUE.

(a) *In Ancient Times.*

It is only recently that the true significance of medical allusions upon ancient coins, as commemorating incursions of The Plague as the one pre-eminent epidemic of those days, is commencing to be understood. Very learned disquisitions exist regarding the attributes and cult of Æsculapius, Apollo, Hygieia, Panacea, Salus, and Telesphorus, to several of which I referred in Section I. ; but they are all from the purely antiquarian standpoint, as contradistinguished from that of the historian, and in none of them is the subject approached from what one would suppose the most natural quarter, that of medicine. Pfeiffer and Ruland, the ablest of all authorities to discuss these interesting questions, have but in the briefest manner referred to the numismatic evidences of ancient pestilences. As regards The Plague, all that they attempt is to mention ten instances of the occurrence of Apollo, the father

of Æsculapius, upon coins of Trebonius Gallus and Volusianus.* There are in addition similar ones that were issued by Postumus and Valerianus, though they were unknown to P. and R., and they bear not only the dative, Apoll. Salutaris, quoted by those writers, but Apol. and Apollini, and also the full nominative, Apollo Salutaris. In a single instance there is, ungrammatically, Apollo Salutari; but this, though acknowledged by good authority as genuine, was very likely through the elision of the final letter of the adjective by the wear of time. The following is a brief summary of them. Apollo Salutaris, struck by Trebonius Gallus, in A.D. 251† (this plague was widely located, and lasted for fifteen years); and also by Postumus, A.D. 259.‡ Apollo Salutaris, Trebonius Gallus,§ and Valerianus, A.D. 253.|| Apollini Salutaris, Trebonius Gallus.¶ Apoll. Salutaris, T. Gallus,** and Volusianus, A.D. 251.†† Apol. Salutaris, T. Gallus.‡‡

It has been considered by some medical authors that Apollo not merely prevented, but at times caused §§ epidemics. Generally, however, his function has been considered wholly preventive, unless, indeed, curative like that of his son, Æsculapius himself; the appellation Salutaris being apparently identical with Salutifer. Instances even occur upon coins of the representation of Apollo with the serpent-encircled staff (Schlangenstab) of Æsculapius.‖ In all of these instances it is more than probable that the coins in question, whether of Rome or Greece, commemorate the commencement, progress, or cessation of an epidemic of The Plague. The same is also true with coins representing the Roman Goddess Salus. Notwithstanding the opinion that "in spite of her resemblance to the Greek goddess of Health, Hygieia, she always maintained her own personality tolerably distinct as the patroness of

* *Loc. cit.*, p. 73, Nos. 220-30.

† Birago. *Imperatorum Romanorum Numismata*, Milan, 1730, fol. p. 359.

‡ *Ibid.*, p. 391. § *Ibid.*, p. 359. || *Ibid.*, p. 366. ¶ *Ibid.*, p. 358.

** *Ibid.*, p. 359. †† *Ibid.*, p. 362. ‡‡ *Ibid.*, p. 358.

§§ Ball. *The Practice of Medicine among the Greeks prior to the Age of Hippocrates*, *Journal of Am. Med. Ass'n*, March 19th, 1887; Reprint, Chicago, 1887, p. 17.

‖ Wroth. *Apollo with the Æsculapian Staff*, *Numismatic Chronicle*, ii., 3d series, pp. 301-305; Reprint, London, 1882; *ibid.*, *A Statue of the Youthful Asklepios* (from *Journal of Hellenic Studies*), London, 1883, p. 6.

material prosperity, the upholder of the Roman State, and protectress of the sacred person of the Emperor." * Salus is found with either of Hygieia's emblems, the serpent and patera of divination, or both, and the opinion now advanced is confirmed by the fact that during a pestilence of The Plague that occurred B.C. 180, the Sibylline Books "command the presentation of gifts to Salus, in union with Apollo and Æsculapius." †

Every medical man would be interested had I here the space to continue this important research into ancient medical history. I will refer, however, but to one other point, which might with equal pertinence have been presented under the previous section, IX., Famine.

The city of Pergamon, in ancient Grecian Mysia, was famous for its temple of Æsculapius, which was built, it is supposed, from there being there some lukewarm mineral springs. The coins of that city for a very long period bore representations of the god of Healing. Two or three of them, struck by Lucius Verus, gave also at the feet of Æsculapius a small animal, which was at first supposed to be a sow, ‡ rooting with its snout; with reference, perhaps, to the discovery of the medicinal springs at Pergamon by this animal; as was since clearly represented by a rooting wild boar, upon the two modern medals of Teplitz, Nos. 271 and 272. What was thought, however, a sow, has since been found to be a mouse or rat gnawing an article of food. § Now, the mouse does not occur elsewhere upon the Æsculapian coins, while it does upon those of Apollo when surnamed Sminthios, for he was considered the destroyer of these pests of agriculture. || The ancients recognized the occurrence of rat- or mouse-famines, of which in modern times I have given medallion illustrations in Section IX., Nos. 692-94, and they also appreciated the connection of these with the outbreak of pestilence. Strabo,

* Wroth, Hygieia (from *Journal of Hellenic Studies*), London, 1884, p. 19.

† *Ibid.*, p. 20.

‡ Panofka. Asklepios und die Asklepiaden, Berlin, 1846, p. 295, pl. ii., No. 4; Mionnet, iii., p. 603, No. 589.

§ Wroth. Asklepios and The Coins of Pergamon, *Numismatic Chronicle*, ii., 3d series; Reprint, London, 1882, p. 39.

|| *Ibid.*

for instance, stated that in Spain the great multitude of rats there occasioned pestilential diseases. What, then, is more likely than that the coins of Pergamon bearing a rat or mouse gnawing food at the feet of Æsculapius, instead of merely having "reference to some mystic rites of initiation or divination," as supposed by Wroth,* in reality directly record as a historical fact that during the reign of the Emperor Lucius Verus, and between the years A.D. 161-69, there was in the Grecian province of Mysia an outbreak of The Plague, occasioned by failure of the harvest through its destruction by rats or field-mice.

The application of similar reasoning to what are generally considered merely arbitrary or meaningless symbols upon ancient coins and medals unlocks an entirely new and unsuspected treasury of history, and thus may eventually be recovered, through the attainment of new facts and the corroboration given to obscure and doubtful passages in classical authors, the sanitary and medical records, till this time very imperfect or lost, of ancient Greece and Rome.

A. ENGLAND.

(b) *In Modern Times.*

John Howard. "An account of the Principal Lazarettos of Europe, with various papers relating to The Plague," etc. 1789, 4°.

Howard's medals were described under Section I., Nos. 31-56, and referred to again in the previous subdivision of the present section, where I presented a twenty-sixth and twenty-seventh token of his, Nos. 697, 698, in addition to those already given.

B. FRANCE.

Dr. J. B. N. Boyer, of Paris. "Historical Account of the Plague in Marseilles."

His medals have been described in the previous subdivision of the present section, Nos. 703-707.

Dr. R. N. D. Desgenettes, of Paris. "Notice sur un livre sur la peste." Paris (1826), 8°.

His medal was described under Section I.

* Wroth. Asklepios and The Coins of Pergamon, *Numismatic Chronicle*, ii., 3d series; Reprint, London, 1882, p. 42.

Dr. Philippe Hecquet, of Paris (1661-1737). "Traité de la peste." Paris, 1722, 4°.

711. Obverse. The Arms of the Paris Faculty ; within a scrolled shield, three storks to left, with sprigs of marjoram ; above, a blazing sun. Legend : Urbi et Orbi. Exergue : M.Ph.Hecquet Abbav(illensis).Facul.Med.Paris Dec(anus). 1713.

Reverse. Serpent ascending a mountain, from front ; at top, a rectangular temple. Legend : Monstrat Iter. Edges milled. Silver, copper, gilt bronze. 18.

Duisburg has a dot after Paris ; Kluyskens omits that after Urbi.

Kluyskens, ii., p. 22, No. 2 ; Duisburg, p. 81, ccxxxi., 2.

This is in my collection from that of Dr. Chéreau, and is extremely rare. It was unknown to Rudolphi. The probability of the above reverse having been muled with the obverse of another dean of the Parisian University, Dr. Boyer, has already been mentioned, No. 703.

712. Obverse. Bust, to right, with flowing wig. Inscription : Ph.Hecquet—Abbav. M(edicorum). P(arisiensium). De(canus). Exergue : N(ic.). R(oussel).

Reverse. Serpent ascending a mountain from left ; upon top, a circular temple ; above, clouds. Legend : Monstrat Iter. Exergue : 1714. Edges milled. Silver, bronze, gilt. 18.

Kluyskens omits the P before De. Rudolphi omits the date.

Fr. Rotscholtz, p. 233, No. 102 ; Rudolphi, 1829, p. 71, No. 299 ; Duisburg, p. 81, ccxxi., 1 ; Kluyskens, ii., p. 22, No. 3.

This is in my collection, from that of Dr. Chéreau, and is very rare.

Kluyskens thought that there was a third variety, composed of the obverse of No. 2 and reverse of No. 1, but I consider this doubtful. It may, however, prove to exist.

Dr. L. Joubert. "De peste." Lyons, 1567, 8°.

His medal has already been described under Section I.

Dr. Étienne Pariset. "Mémoire sur les causes de la peste et sur les moyens de la détruire."

One of the Pariset medals has been given in the preceding

subdivision of this section, No. 708, and the others will very shortly be described.

C. GERMANY.

Leopold, Graf von Berchthold (1759 [1738, Thomas, Biographical Dictionary. This, however, proved wrong by the medal]-1809). "The Howard of Germany" (Duisburg), he made journeys into Asia and Africa to discover the origin and cure of The Plague.

713. Obverse. Bust. Beneath, A. Guillemard F. Inscription : Leopold Graf V. Berchthold.

Reverse. An oak crown, with stars. Beneath, Dem Freund Der Humanität Und Ihrem Opfer. Inscription upon rim : Geboren Den 9 July 1759. Gestorben Den 26 July. 1809.

Ampach, ii., 9301; Wellenheim, ii., 2, n. 13,217; Duisburg, p. 143, ccclxxxii.; Rüppell, 1875, p. 42; Böhmsche Privat. Med., i., 13, 5, fig. Unknown to Rudolphi and Kluyskens.

Johann Henis (1585-1666). "Kurtzer Bericht von der Pestilentz," etc. Augsburg, 1621, 16°.

714. Obverse. Bust to right; beneath, Cormano F. Inscription : Jo. Henis D. Comm. Pal. Eq. D. M. Loimiat. Ger. Et. Ital. P. C.

Reverse. A. Ω. Cadent A Latere Tuo Mille Et Decem Millia A Dexteris Tuis, Te Autem Non Appropinquabit. Ps. 91. Silver, bronze. 42 mm.

Kluyskens has Dextris. Gaetani, ii., p. 78, pl. 118, No. 4; Rudolphi, 1829, p. 72, No. 304; Kluyskens, ii., p. 27; Duisburg, p. 112, ccxcviii.

715. Obverse, similar to above.

Reverse. Inscription, engraved : Nobili Wolfgango Sulsero Ampl. Viri Hier. Filio Patricio Augustano Histor. Polit. Et. Juris Utriusque Peritissimo Animi Mei Possessori Corporis Hanc Umbram Amor Signet. Monumen. Lubens Meritoque D. D.

Binder, p. 545, No. 220; (P. V. Stetten) Die Vornemsten Merkwürd. der Reichset. Augsburg, 1772, p. 143; Duisburg, Suppl. ii., 1868, p. 10.

716. Obverse similar, but engraved. No reverse.

Rudolphi, 1829, p. 72.

T. Jordan. "Pestis phenomena," etc. Frankfurt A-M., 1576, 12°.

Already described under Section IV., Mineral Springs.

Dr. Ambrosius Jung, of Augsburg (1471-1548 [1559, Index Catalogue of Surgeon-General's Library]). "Tractatulus perutilis de pestilentia." Augustae, 1494, 4°.

717. Obverse. Bust. Inscription: Ambrosius. Jung. Artium. Et. Medicinae. Doctor. An. Aetatis. 57.

Reverse. Arms. Legend: Justitia Nostra. Christus 1528. Tin. 70 mm.

Rudolphi and Kluyskens have no dot after Aetatis.

Gaetani, i., p. 227, pl. 51, No. 2; Moehsen, i., p. 49; Rudolphi, 1829, p. 83, No. 347; Binder, p. 561, No. 42 (Friedländer MS.); Duisburg, p. 101, cclxx.; Kluyskens, ii., p. 74.

Dr. Johann Klainmüller, of Augsburg (1473-).

He was called Kleinmuther by Oberthur, but Rudolphi investigated the question, and found that there had been a twofold typographical error, the medal being correct. He effected the passage of a law to control The Plague, in 1521.

718. Obverse. Bust to left, in cap and cloak; at sides, M.D.—XXVII. Inscription: Johan·Klainmvlher·Der·Erczney. Doctor·Augustan·Im·Alter·LIIII·

No reverse. Bronze; cast. 100 mm.

Rudolphi, Kluyskens, and Duisburg have the date and age in Roman numerals, and Kluyskens omits the dots after Johan and Doctor.

Oberthur, p. 67, No. 284; Moehsen, i., p. 41, fig.; Rudolphi, 1829, p. 86, No. 360; Kluyskens, ii., p. 89; Duisburg, p. 98, cclxvii.

Dr. Johann Crato Von Kraftheim (1519-85). He wrote upon The Plague.

719. Obverse. Bust. Inscription: Maximilian. II. Rom. Imp. Sem. Aug. Ger. Hun. Boh. Rex.

Reverse. Bust. Inscription: Jo. Crato. A. Craftheim. Cons. Et. Med. C(aesar).

Duisburg, p. 105, ccclxxxii., i. Unknown to Rudolphi and Kluyskens.

720. Obverse. Bust. Inscription: Maximilianus Rom. Imper.

Reverse. Bust. Inscription: Joh. Crato A Craftheim Consil. Et Med. Caes. Silver, tin. 32 mm.

Kundmann, *Silesiis in nummis*, p. 389, pl. 28, No. 85 ; *Böhmische Med.*, No. 212 ; Rudolphi, 1829, p. 38, No. 148 ; Kluyskens, i., p. 230, No. 1.

Kluyskens speaks of this medal as in the Royal Cabinet at Berlin. It is not mentioned by Duisburg, who, however, makes no reference whatever to Kluyskens when describing the medals of Von Kraftheim.

721. Obverse. Bust. No inscription. Exergue : Aetas (Sic) A(nno). xxx.

Reverse. Coat of arms. Inscription : Johan Crato: Art: Et: Med: Doct. Confide: Recte: Agens. An.LI. (1551.) Oval. Silver, lead. 40 mm.

Kluyskens has only single dots, and omits them after Confide, Recte, An, and the date.

Kundmann, pl. 28, no. 86 ; *Böhmische Med.*, No. 209 ; Rudolphi, 1829, p. 38, No. 149 ; Kluyskens, i., p. 230, No. 2 ; Duisburg, p. 105, cclxxxii., 2.

722. Obverse. Bust to right. Inscription : Jo Crato A Craftheim. Cons. Et. Med.Caes.

Reverse. Samson tearing apart the lion's jaws. Legend : Irae Modereris Et Ori. Oval. Lead. 30 mm. Thought to be by Antonio Abondio.

Gaetani has upon his figure Craithelm and E., and after the latter a semicolon. Kluyskens omits the dot after Craftheim, and has E for Et.

Preuss, *Memoria Jaenisiana*, appendix to *Ephem. Nat. Cur. Cent. v.-vi.*, p. 217, fig. ; Kundmann, pl. 28, No. 87 ; Gaetani, i., p. 422, pl. 95, No. 5 ; *Böhmische Med.*, No. 211 ; Rudolphi, 1829, p. 38, No. 150 ; Kluyskens, i., p. 230, No. 3 ; Duisburg, p. 105, cclxxxii., 3.

723. Obverse. Bust to left. Inscription : Joannes Crato Phil. Et. Med.D.

Reverse. A female, seated, with her hand upon her breast, gazes upward in prayer. Legend, to right : Fide Deo Fac Recta ; to left, *Οι χει θεος ενδικου ομμα*. Oval. Silver. 25 mm.

Gaetani in his figure gives merely the name upon obverse, and omits the Greek legend upon reverse, although he mentions it in his description. Kluyskens has *ενδικου*.

Kundmann, pl. 29, No. 88 ; Gaetani, i., p. 422, pl. 95, No. 4 ; *Böhmische Med.*, No. 210 ; Rudolphi, 1829, p. 38,

No. 151 ; Kluyskens, i., p. 231, No. 4 ; Duisburg, p. 105, cclxxxii., 4.

724. There was a medal of gold struck in 1574 by the Emperor Maximilian II. in honor of Von Kraftheim, who was his court physician.

Hekelius. " Numus aureus," etc. Jena, 1695, 4°. Preuss. *Loc. cit.*, p. 217.

Rudolphi (1829, p. 39) and Kluyskens (i., p. 231) refer to the fact, but give no description. Duisburg (p. 106) thinks it was probably the first of those above given. This, however, may be doubted.

There are engravings of two of the medals of Von Kraftheim in the Library of the Surgeon-General's Office at Washington.

Dr. David Samuel Von Madai, of Halle (1709-80). He translated into Hungarian C. S. Richter's work on The Plague. Halle, 1738, 8°.

725. Obverse. Bust, to right, with flowing hair. Beneath, F. W. Wermuth. Inscription : Dav.Sam.A Madai Hvng (arvs). Consil.Avl. & Archiat. Princ. Anhalt. C(oethen).

Reverse. Viro | Arte Medica | Candore In Amicos | Meritis In Rem Nvmariam | Excellenti | Hoc Amicitiae Monvmentvm | Dicat | J: A(ugustus): A P(onikau): MDCCLXXIII. Silver, tin. 42 mm.

Durand has Et on obverse, and Amicitia on reverse. Rudolphi, Renauldin, Kluyskens, and Duisburg have Monumentvm, and the date in Roman numerals. In Kluyskens's figure the engraver's name is given as Wernuth.

Rudolphi, 1829, p. 98, No. 415 ; Renauldin, p. 538 ; Kluyskens, ii., p. 174, fig. ; Duisburg, p. 130, cccxvi. ; Durand, p. 121, pl. ix., No. 2 (obverse).

The figure by Kluyskens had appeared as the frontispiece of one of Von Madai's numismatic works, which obtained for him and his descendants, from the Emperor Joseph II., the Countship of the Holy Roman Empire.

726. Obverse. Bust, to left. Inscription : Magister Supremus III. Halensis.

Reverse. Faith, with sun upon her breast ; her left hand supported by a book, against which leans a cross. Her right holds a shield, on which are three united hearts. Field, irradiated by the sun. Legend, above : Conjunge Juvabit (It de-

lights in Union). Exergue : 17|47, in two lines, between which the arms of the city of Halle.

Marvin, *American Journal of Numismatics*, July, 1879, p. 12, No. cccxciv. ; *ibid.*, Medals of the Masonic Fraternity, p. 154.

This was unknown to Rudolphi, Kluyskens, Duisburg, Rüppell, and Durand. Merzdorf refers, as authority for it, to a pamphlet published at Halle during the year in which it was dated.

Von Madai was the third Grand Master of the Masonic Lodge at Halle.

D. BOHEMIA.

Dr. Johann Jessensky (Jessenius), of Prague (1556 [Index Catalogue, Surgeon-General's Office ; 1566, Duisburg] -1621). "Adversus pestem consilium," etc. Ciessen, 1614, 16°.

727. Obverse. Bust. Inscription : D. Joann. Jessensky. De Magna Jessen.

Reverse. Arms. Inscription : Rector Acad. Carolin. Pragense. Et Med. Caesar. Silver, tin.

Rudolphi and Kluyskens have no dot after Jessensky.

Kundmann, 395, pl. 29 (pl. 2, Kluyskens), No. 89 ; Böhmische Med., No. 173 ; Rudolphi, 1829, p. 82, No. 343 ; Kluyskens, ii., p. 69 ; Duisburg, p. iii., ccxcv., 1.

728. Similar to preceding, save that bust and inscription are smaller and closer ; and upon reverse, 1618. Oval.

Böhmische Med., No. 171 ; Duisburg, p. iii., ccxcv., 2. Unknown to Rudolphi and Kluyskens.

729. Obverse. Bust. Inscription : Doc. Joan. Jessensky De Magna Jessen.

Reverse. Arms. Inscription : Rect. Acad. Carolin. Pragense. EC (et cetera).

Böhmische Med., No. 172 ; *Mediz. Fahr. d. k. k. Oesterr. Staates*, 1843, p. 76 ; Duisburg, p. iii., ccxcv., 3. Unknown to Rudolphi and Kluyskens.

E. ITALY.

Dr. Jacopo Francesco Arpini (—1684). He was physician to Maurice, Duke of Savoy, and wrote on The Plague of 1654.

730. Obverse. Bust. Inscription : Jac. Fran. Arpinus. D. Med. Ser. Prin. Sab. 1659.

Reverse. Disk with handles, adherent at side to a billet. Legend : Omnibus Non Omnibus. Bronze.

Biografia medica Piemontese, Turin, 1824, i., 312 ; Duisburg, p. 19, xlvi. Unknown to Ruldolphi and Kluyskens.

Dr. Giuseppe Ferrario, of Milan (1802-67). "Risposta sulle peste bubonica orientale." Milan, 1845, 8°.

731. Obverse. Bust, to right. Beneath, Castiglione, 1851. Inscription : Doctor Joseph Ferrario Medicus Chirurgus Statista. Mediolani Natus 19 Januarii 1802.

Reverse. Above, the Divine Eye within triangle. Inscription, in ten lines : Fundator Pii Instituti Lombardia Pro Medicis Chirurgis Eorum Viduis Puerisque Et Academiae Phisio-Medico-Statisticae Mediolani 1842-1844 Italo Voto. Bronze.

Duisburg, p. 241, cxii., g, 1. Unknown to Kluyskens.

732. Obverse. Æsculapius between two females, one of whom leans upon a galvanic machine, while the other has a globe and telescope at her feet. Beneath, L.Cossa F. Inscription : Fondazione Del Dottore Giuseppe Ferrario. Exergue : The Arms of Milan. Inscription : 19 Genn. 1844.

Reverse. A laurel crown. Inscription : Academia Fisisio-Medico-Statistica Di Milano. Bronze.

Duisburg, p. 241, cxii., g, 2 ; Rüppell, 1875, p. 16. Unknown to Kluyskens.

Cardinal Geronimo Gastaldi (1616 [Duisburg ; this date not in Thomas's Biographical Dictionary nor in the Index Catalogue of Library of Surgeon-General's Office] -85). "Trattatus de avertendâ et profligandâ peste." Bologna, 1684, fol.

733. Obverse. Bust. Inscription : Hieronymus S.R.E. Presb. Cardin. Gastaldus.

Reverse. Coat of arms. Inscription : Fundavit. Anno. 1685. Gaetani, ii., p. 139, pl. 132, No. 3 ; Duisburg, p. 19, xlix.

F. RUSSIA.

Dr. Georg Thomas, Baron Von Asch (1729-1807). Imperial physician, he arrested The Plague during the Russo-Turkish campaign of 1770 in Hungary and Poland, along the Danube.

734. Obverse. Bust, to right. Beneath, (Johann Baptiste) Gass (of St. Petersburg). Inscription : Ge(orgius)L(iber). B(aro). De Asch S.C.M. Ross. A. Consil. Statvs. P.

Reverse. Hygieia offering the patera to a serpent entwined about a tripod. Inscription : Liberator A Peste. Exergue : In Bello Turcico | Ad Istrvm. | MDCCLXX. Silver, bronze. 50 mm.

Kluyskens and Duisburg have Roman numerals. Rudolphi and Kluyskens omit dot after A on obverse and after Istrvm.

Lengnich, *Neue Nachrichten*, etc., Danzig, 1782, 8°, fig., frontispiece ; Rudolphi, 1829, p. 4, No. 14 ; Duisburg, p. 190, dxii. ; Pfeiffer and Ruland, p. 123, No. 367. Unknown to Kluyskens.

Gregor Gregoriwitsch, Graf Von Orloff. He suppressed The Plague at Moscow, in 1771.

735. Obverse. Bust, to left. Beneath, G.C.Wachter F. Inscription (in Russian) : Graf Gregorii Gregoryewitsch Orlow, Count of the Roman Empire.

Reverse. Orloff mounted, like a second Curtius plunging into the abyss. In background, the city of Moscow. Beneath, I.G.W.F. Legend (in Russian) : Holy Russia has such sons. Exergue (in Russian) : For the Deliverance of Moscow from The Plague in the year 1771. Bronze. 59. P. and R., p. 124, No. 368.

Nicolaus Petrowitsch, Graf Von Scheremetieff. He subdued The Plague in Russia, in 1804.

His medal was described under Section IX., *Famine*, No. 405.

It was unknown to P. and R.

G. ROUMANIA.

Michael, Graf Von Sturdza, of Moldavia.

736. Obverse. Bust, to left. Beneath, C.Voigt. Inscription : Michaeli Gr.Sturdza—Princ.Moldaviae.

Reverse. Hygieia, with altar entwined by serpent. Inscription : XXI. Millia Sanatorum Tibi Soteria Ferunt. Exergue : A Medicis Moldaviae | MDCCCXLII. Bronze. P. and R., p. 125, No. 371.

As Turkish hospodar, Sturdza checked The Plague in the Danubian principalities in 1842. P. and R. have no doubt as to the true character of this epidemic, though at so recent a date.

There are also medals and tokens especially commemorative of epidemics of The Plague.

A. THE UNITED STATES.

The Elephant tokens of New England and Carolina seem to be of this character. The obverse of them all is from the same die as that of the London token of 1694, with similar device. Snelling, as long ago as 1769, while speaking of the several origins that have been suggested for the latter piece, such as that it was for circulation at Tangier, Africa, which, however, never occurred, as also that it was the issue of a London workhouse, considers that it may have been struck in memory of the great visitation of The Plague in 1665. Crosby quotes this, but thinks that the American Elephant tokens were "probably struck only as medals, to increase or perpetuate the interest in the American Plantation." My own impression is that since the London token appeared, within thirty years after the Great Plague of that city, Snelling's view was correct, and that the legend "God preserve London" was in the nature of a pious prayer that the dread disease, which in that attack carried off no less than sixty thousand of the inhabitants of the city, might never return. The American "elephants" bear date of the same year, and it is but reasonable to suppose that his devout wish was extended by the designer to the people of New England and "The Lords Proprietors of Carolina."

(a) *New England.*

737. Obverse. An elephant, to left.

Reverse. God : | Preserve : | New : | England : | 1694.
Borders milled ; edge plain. 17 to 18½.

Dickeson, *American Numismatic Manual*, p. 72 ; Crosby, *Early Coins of America*, p. 337, pl. ix., No. 3, and of copy, No. 29 ; Frossard, *Monograph*, etc., p. 49, obverse figured pl. ix., No. 3 ; *Coin Collectors' Journal*, April, 1887, p. 59.

Crosby states that but two of these pieces are known—that in the Appleton Collection, weighing 236 grains, while that in the Parmelee but 133. There are copies by A. S. Robinson. An original brought \$235 at the Mickley sale.

In a photograph from the Parmelee original, given in a paper by Mr. Edward Eggleston, there are no dots in the legend.*

(b) *Carolina.*

738. Obverse as the preceding.

Reverse. God | Preserve | Carolina And | The Lords | Proprietors (sic). | 1694. Milled borders; plain edge. Copper. 18½.

Dickeson has Lord, in the singular, in his description of the legend. Eggleston's photograph from Parmelee has semicolons after Preserve, The, and Lords, and is without the final dot.

Dickeson, p. 70; Crosby, pl. ix., fig. 2, and of copy, fig. 28; Frossard, p. 49; Bushnell Catalogue, 20-24, June, 1882, No. 185, fig.; *Coin Collectors' Journal*, Oct., 1887, p. 156, fig.

The only originals are in the Appleton and Parmelee collections. There are copies by J. A. Bolen, one of which I own.

739. Obverse as preceding.

Reverse also, save Proprietors, the die having been altered so as to give O instead of E; traces of the latter are, however, still visible.

Crosby, *Coin Collectors' Journal*, Oct., 1887, p. 156.

The Carolina "elephants" are more regular in weight than the New England, ranging from 130 to 162 grains.

B. ENGLAND.

740. Obverse. An elephant, to left.

Reverse. Arms of the city. Legend: God: Preserve:—: London: 1694.

Numismatische Zeitung, 1846, p. 189; Neumann, No. 4404; Crosby, pl. ix.

741. There is a variety of this. Neumann, No. 4405. A specimen is in the numismatic cabinet of Harvard University. It is extraordinarily rare.

The preceding Plague tokens or medals were all of them unknown to Pfeiffer and Ruland.

* Eggleston, Commerce in the Colonies, *Century Magazine*, June, 1884, p. 242.

The London alchemist's token of T. Townshend, 1760—"The Original Spaw (Spa) In St. George's Fields. So Memorable in The Plague 1665"—was described under Section IV., Mineral Springs, No. 243.

From this point, I can but briefly allude to the remaining Plague medals and tokens, and shall merely give their references in Pfeiffer and Ruland, as they have been so accurately described by these pre-eminently accomplished medical numismatists.

C. FRANCE.

(a) *Provence* (1720-22).

742. P. and R., p. 122, No. 363. This is in the Fisher Collection.

(b) *Marseilles* (1784).

743. Obverse. A female figure (the city of Marseilles) pointing to laborers conveying goods into the lazaretto. N. Gatteaux F. Legend : *Securitas Publica*.

Reverse. An oak wreath. Inscription : *Sexdecim Viris Saluti Publicae Tuendae Quod Indefesso In Arcenda Peste Studio Orientale Commertium Forerunt. Exergue : Praemium Ab Optimo Princ. Instit. MDCCLXXXIV.*

In the Norblin Catalogue, sixty instead of sixteen persons were erroneously mentioned as honored.

Cat. des Poinçons, etc., Musée Monétaire, Paris, p. 293, No. 42 ; Norblin Catalogue, 1835, No. 3062.

This medal, intended to encourage the re-establishment of French commerce with the East, through regulating Quarantine, is in the Lee Collection. It was unknown to P. and R. There is another with the same obverse, which will be mentioned hereafter, in Section XI., Military and Naval Hygiene.

An epidemic of The Plague at Marseilles is recalled by the previous medal, No. 742.

It might be supposed that there also existed a Plague medal of the city of Mons, near Toulon, in the Department of Var, from the following book title : "Toilliez. Notice Sur une medaille relative a la peste de Mons de 1615 à 1616" (Van Peteghem Cat., Paris, 1877, No. 983, and *ibid.*, 1881, No. 651). I sent for the book, but the copy in question had been sold. I have since, however, obtained evidence that the cor-

rect title should read "la prise (capture) de Mons," etc., which would throw it out of the range of our consideration.

D. HOLLAND.

(a) *Leyden* (1574-1774).

744-47. P. and R., p. 90, Nos. 273-76.

E. BELGIUM (1779).

748. *Ibid.*, p. 124, No. 369. This is in the Fisher Collection.

(a) *Brussels* (1667-79).

749. Neumann, No. 35,004; P. and R., p. 110, No. 325.

750. *Ibid.*, p. 185, No. 325^a.

F. GERMANY.

(a) *Altenburg* (1598-1602).

751-53. *Ibid.*, p. 93, Nos. 284-86.

(b) *Breslau* (1693-1714).

754, 755. *Ibid.*, p. 104, Nos. 293, 294.

756, 757. *Ibid.*, p. 114, Nos. 335, 336.

(c) *Erfurt* (1597, 1611).

758, 759. *Ibid.*, p. 93, Nos. 281-83.

(d) *Frankfurt-on-the-Main* (1635).

760. *Ibid.*, p. 105, No. 297.

(e) *Hamburg* (1709-13).

761-70. *Ibid.*, p. 115, Nos. 337-46.

(f) *Ingolstadt* (1633)

771. *Ibid.*, p. 105, No. 296.

(g) *Leipsic* (1680).

772. *Ibid.*, p. 111, No. 327.

(h) *Magdeburg* (1683)

773, 774. *Ibid.*, p. 112, Nos. 332, 333.

(i) *Munich* (1637).

775-800. *Ibid.*, p. 105, Nos. 298-316 ; p. 184, Nos. 310^a, 311^a, 312^a, 312^b, 313^a, 315^a, 315^b.

Several of these, the so-called St. Benedict medals, are in my collection.

(j) *Ratisbon* [*Regensburg*] (1714).

801-803. *Ibid.*, p. 118, Nos. 349-51.

(k) *Silesia* (1634).

804. *Ibid.*, p. 104, No. 295.

(l) *Weimar* (1598).

Ibid., p. 93, Nos. 284-86.

These are the same as those mentioned under Altenburg, Nos. 751-53.

(m) *Wittenberg* (1528-51).

805-47. *Ibid.*, p. 76, Nos. 231-72.

The above are known as the Wittenberg, or sometimes Anabaptist, Pest-thalers. They are of several types. Specimens are in the Lee and Fisher collections, and my own.

(n) *Wurzburg* (1681).

848, 849. *Ibid.*, p. 111, Nos. 328, 329.

G. AUSTRIA.

(a) *Baden, near Vienna* (1714).

Ibid., p. 120, Nos. 357-59 ; p. 185, No. 359^a.

These were described under Section II., Water-Supply, Nos. 105, 106.

(b) *Meidling* (1714).

850. *Ibid.*, p. 121, No. 360.

(c) *Neuburg* (1714).

851. *Ibid.*, p. 121, No. 361.

(d) *Prague* (1713).

852, 853. *Ibid.*, p. 117, Nos. 347, 348.

(e) *Stöckerau* (1714).

854. *Ibid.*, p. 121, No. 362.

(f) *Trieste* (1769).

855, 856. *Ibid.*, p. 123, Nos. 365, 366.

This is a medal of the Quarantine Hospital at Trieste.

(g) *Vienna* (1679, 1714).

857. *Ibid.*, p. 110, No. 326.

858. *Ibid.*, p. 119, No. 352.

859-63. *Ibid.*, p. 120, Nos. 353-56; p. 185, No. 356^a; H. R. Storer, *The Medals of St. Charles Borromeo*, *American Journal of Numismatics*, Oct., 1888, pp. 37, 38, Nos. 35-9.

The two following, like the five last, are medals of the Votive Church, at Vienna, built upon the suppression of The Plague, and dedicated to St. Charles Borromeo, Archbishop of Milan. They were unknown to P. and R.

864. Obverse. The Church.

Reverse. Inscription: Aedes · | B(eati) · Carol · Bor · | Vin ·
dob(onae) · | Renov(ata) · Silver. 11 mm.

Montenuovo Cat., 1882, parts 9-14, p. 156, No. 2350; H. R. Storer, *Loc. cit.*, p. 38, No. 40.

Struck upon the Restoration of the Church, in 1806.

865. Obverse. The same church at Vienna.

Reverse. In HonoreM | SanCti CaroLI., etc. Brass. 36 mm.

Montenuovo Cat., p. 168, No. 2574; H. R. Storer, *Loc. cit.*, p. 38, No. 41.

St. Charles Borromeo during The Plague at Milan was a singular instance of the devotion to the sick and dying that characterizes the reverend clergy. There are, exclusive of the seven of the Votive Church, some thirty-four medals of him, which I have elsewhere described (*Loc. cit.*). Of these, one is in the Fisher Collection and six are in my own. I have besides impressions of several of the others, from Signor Francesco Gnechi, of Milan.

H. ITALY.

(a) *Ancona* (1734).

866. P. and R., p. 122, No. 364.

A medal of the lazaretto.

(b) *Milan* (1576).

867. *Ibid.*, p. 91, No. 277.

(c) *Rome* (1580, 1656-57, 1662).

Pope Gregory XIII.

Spes Opis Ejusdem.

868. *Ibid.*, p. 92, No. 280.

Pope Alexander VII.

Vt Vmbra Illivs Liberarantvr.

869-70. *Ibid.*, p. 109, Nos. 318, 319.

Two varieties. The first of them is in my collection.

871. Popvlvm Religione Tvetvr.

Ibid., p. 109, No. 320.

This is in my collection.

872. Like the preceding, save that it was struck in the second instead of the third year of the pontificate.

I have this, but it was unknown to P. and R.

873-75. Immacvlatae—Virgini · Vot·

Ibid., p. 109, No. 321 ; p. 110, Nos. 323, 324.

876-78. Quae Vovi Reddam Pro Salvte Domino.

Ibid., p. 109, Nos. 322-24.

(d) *Tivoli* (1656).

879. *Ibid.*, p. 109, No. 317.

(e) *Urbino* (1631).

880. *Ibid.*, p. 102, No. 287.

(f) *Venice* (1576, 1631, 1793).

881-88. *Ibid.*, p. 91, Nos. 278, 279 ; p. 102, Nos. 288-92 ; p. 125, No. 370.


I. POLAND.

(a) *Cracow* (1707).

889. *Ibid.*, p. 114, No. 334.

(To be continued.)

EDITOR'S TABLE.

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THE PROGRESS OF INFECTIOUS DISEASES AND MORTALITY RATES AT THE MOST RECENT DATES, BASED UPON OFFICIAL AND OTHER AUTHENTIC REPORTS.

ALABAMA.—*Mobile*, 40,000 : Reports 67 deaths during September, of which 23 were under five years of age. Annual death-rate, 20.1 per 1000. From zymotic diseases there were 18 deaths, and from consumption, 16.

Decatur : Yellow fever continues.

CALIFORNIA.—The Secretary of the State Board of Health reports the number of deaths during the month of September, 1888, from 64 localities, comprising a population of 702,700, 882 representing an annual death-rate of 15 per 1000. Consumption caused 116 deaths—over one sixth of the total mortality. Zymotic diseases, 163, the chief of which were : Diarrhœal diseases, 44 ; diphtheria (and “croup”), 34 ; typhoid-fever, 42 ; remittent-fever and typho-malarial-fever, 17.

Small-pox during the month numbered 24 cases in San Francisco, 1 each in Stockton, Livermore, Elk Grove, and Sacramento. All were strictly quarantined and the spread of the disease prevented.

San Francisco, 300,000 : Deaths during the month, 426 ; from zymotic diseases, 45 ; small-pox, 2 ; consumption, 68 ; acute lung diseases, 30.

Los Angeles, 80,000 : 47 ; from consumption, 6 ; zymotic diseases, 8.

Oakland, 50,000 : 70 ; from consumption, 5 ; acute lung diseases, 6 ; from zymotic diseases, 19.

San Diego, 30,000 : 14 ; from zymotic diseases, 2.

Sacramento, 35,000 : 37 ; from consumption, 1 ; from zymotic diseases, 9.

CONNECTICUT.—The Secretary of the State Board reports for September, 1888, the total number of deaths returned by 165 towns, comprising a population of 720,976, 1032, representing an annual death-rate of 17.1. Deaths under five years, 352—34.1 per cent.

Typhoid-fever noticeably increased in all parts of the State, in all thirty towns, just double the number of the previous month. There were 52 deaths as against 32 in August.

In several towns the appearance of the disease has been characterized by the occurrence of several cases in close proximity both as to time and place; as if a number of patients had been exposed to the same infection. Diphtheria has also increased, 31 deaths as against 25 in August. The greatest reduction in the mortality was in diarrhœal diseases, 203 against 537 in the previous month.

FLORIDA.—*Yellow-fever* continues to be the absorbing topic of interest to the civil authorities of Florida, and the special care of the United States Marine Hospital Service.

New cases continue to be reported in Decatur, Alabama; Jacksonville, Tampa, Palatka, Palmetto, Gainesville, Fernandina, Sanford, Manatee, Enterprise, Live Oak, and probably other places in Florida; indeed, the disease is as yet (November 15th) wholly unabated there, and the general distribution of fomites, referred to in our previous number, in the absence of frosty weather, involves continued danger, and the more by reason of the unsanitary surroundings of many towns, which, according to the inspectors' reports under the direction of the Surgeon-General of the Marine Hospital Service, commonly obtain.

Yellow-fever continues to prevail as usual at this season of the year in *Havana*. Deaths reported during the month of October, 48.

The sanitary inspector, Dr. D. M. Burgess, states that: "Two or three American vessels have had the misfortune, after entering the port and anchoring in the bay, to become surrounded by infected vessels, fresh in their pollution after discharging at infected wharves for many days, and have consequently been invaded by yellow-fever. Conspicuously the ship Portland Lloyds and bark Nereid."

Santiago de Cuba, during the month of August, 13 deaths ; and during the first fifteen days in September, 17. (Weekly Abstract of Sanitary Reports.)

ILLINOIS.—*Chicago*, 800,000 : Reports 1220 deaths during September, of which 637 were under five years of age. Annual death-rate, 18.30 per 1000. From zymotic causes there were 397 deaths, and from consumption, 107.

IOWA.—*Monthly Bulletin* reports for the month of August that, "aside from consumption and pneumonia, and possibly cholera infantum, *diphtheria* is one of the most fatal diseases in the State. That *insanity* is alarmingly on the increase—worthy the earnest consideration of every thoughtful mind, both as to cause and possible prevention. . . .

"In 1880 the United States Census gives the total population of Iowa as 1,624,611. The proportion of insane to total population in 1870 was 1 to 1609 ; in 1880 it was 1 to 639, an increase of 242 per cent, while the increase of population was but 36 per cent. The total increase of insane population in 1880 was 2554, of whom but 1076 were in the asylums, or less than one half. In 1885 the census report gives the population as 1,753,980. In that year there were in the asylums 1052 persons, and according to the ratio of previous years, the total insane would be 3056, or 1 to 573 of the total population. At the ratio of increase of population of 3 per cent from 1885, the total population in 1887 would be 1,859,218. In 1887 there were in the asylums 1489, with a total increase of 4494, or 1 to 443. From 1880 to 1887 the increase of population was 21 per cent, while the increase of insane was 43 per cent."

Report for the month of September :

Keokuk.—Consumption, 1 ; typhoid-fever, 3. Total deaths, 9 ; death-rate, 0.65.

Davenport.—Diphtheria, 6 ; typhoid-fever, 1 ; consumption, 3. Total deaths, 27 ; annual death-rate, 10.77.

Several cases of typhoid-fever, reported at Anthon, Woodbury County, supposed to have originated in Cherokee County.

MARYLAND.—*Baltimore*, 431,879 : Reports 813 deaths during the five weeks ending September 29th, of which 388 were under five years of age. Annual death-rate, 24.46 per 1000.

From zymotic diseases there were 192 deaths, and from consumption, 94.

MASSACHUSETTS.—*Boston*, 415,000: Reports 831 deaths during September, of which 365 were under five years of age. Annual death-rate, 24.0 per 1000. There were 204 deaths from zymotic diseases, and 107 from consumption.

MICHIGAN.—The Secretary's report, September, 1888, compared with the preceding month, indicates that remittent-fever, bronchitis, and influenza increased, and that neuralgia, cholera morbus, cholera infantum, consumption of lungs, and erysipelas decreased in prevalence.

Compared with the preceding month, the temperature in the month of September, 1888, was much lower, the absolute humidity and the day and night ozone were less, and the relative humidity was slightly more.

Compared with the average for the month of August, in the nine years 1879-87, intermittent-fever, typho-malarial-fever, consumption of lungs, tonsillitis, whooping-cough, diphtheria, neuralgia, and cholera infantum were less prevalent in September, 1888.

For the month of September, 1888, compared with the average of corresponding months in the nine years 1879-87, the temperature was lower, the absolute and relative humidity and the day ozone were less, and the night ozone was much less.

Including reports by regular observers and others, diphtheria was reported present at twenty places in Michigan in September, 1888; scarlet-fever at twenty-four places, typhoid-fever at thirty-five places, and measles at seven places.

Reports from all sources show diphtheria at seven places less, scarlet-fever at one place less, typhoid-fever at seven places more, and measles at the same number of places in the month of September, 1888, than in the preceding month.

Detroit, 230,000: Reports 359 deaths for September, of which 102 were under five years of age. Annual death-rate, 18.89 per 1000. From zymotic causes there were 128 deaths, and from consumption, 29.

MINNESOTA.—The Secretary of the State Board reports: "The whole number of deaths returned as having occurred

in the State during the year 1887 is 13,262 : males, 7093 ; females, 6059 ; unknown sex, 110.

“ Of the total deaths (13,262) I have been unable to include 253 (males, 105 ; females, 142 ; unknown sex, 6) in the classification by causes of death. There were several reasons for this : First, the serious incompleteness of the first reports received under the new law ; second, the duplication of returns by town clerks of the villages in their townships, for under the new law the health officers of such villages make the village returns and the town clerks account for the township outside the village, but under the old law the last accounted for both ; third, my own uncertainty as to the forms and methods of compiling the returns. I do not think this difficulty will occur in 1888.

“ The population of the State in 1885 (census) was 1,117,798 ; the number of families (census), 203,616 ; the population 1887 (estimated) was 1,328,054 ; number of families (estimated), 241,446.

“ Three counties (unorganized), Beltrami, Cass, and Itasca, with a combined estimated population of 1761, made no reports in 1887.”

Infectious diseases reported during the month of September, 1888 : Diphtheria, 71 cases, 17 deaths ; scarlatina, 2 cases, 1 death.

Small-pox appeared September 3d in the township of Wang, Renville County, in the person of a woman just from Norway *via* Quebec. There was slight exposure of thirty-five people, all of whom were traced, vaccinated, or revaccinated, and kept under observation till fifteen days had elapsed. The only ones to suffer were in the family first affected, and another near by, between which intercourse was intimate, they being kindred.

Diseases of animals : Cases of *glanders* remaining isolated or not accounted for, 29 ; reported during the month, 10 ; killed, 17 ; released, 8 ; isolated, 9.

St. Paul, 175,000 : Reports for September 225 deaths, of which 130 were under five years of age. Annual death-rate, 15.48 per 1000. From zymotic diseases there were 99 deaths, and from consumption, 15.

MISSOURI.—*St. Louis* reports: For September, 1888 (440,000), 804 deaths, of which 332 were under five years of age. Annual death-rate, 21.0 per 1000. From zymotic diseases there were 209 deaths, and from consumption, 57.

NEW YORK.—*Eighth Annual Report of the State Board of Health* for 1887 shows marked progress in the development of sanitary knowledge in and co-operative strength with local boards throughout the State for the protection of the public health. Cleanly sites for schoolhouses and other public buildings, drainage, and sewerage; the protection of drinking-water against graveyard and other pollutions; the prevention of factory nuisances and obstructions to the water-courses by railroad and other corporations, are beginning to be the recognized duties of the local boards of health, not by themselves only, but also by the public; and action in recognition of these duties has well-nigh ceased to be called in question.

Moreover, the prompt response of the State Board and the energy displayed by the Secretary and Executive officer, in giving aid to local boards on such questions as the foregoing postulates involve, has had the effect of inspiring increased confidence and expanding its sphere of usefulness. For example, it has been made the court of appeal in the doubtful safety and sanitary condition of a new school building *before* it had been used; and its aid has been invoked by a "Village Improvement Association" against the ravages of typhoid-fever. Such appeals are mile-stones in the progress of practical sanitation.

Of diphtheria, under the head of Contagious and Infectious Diseases, Dr. F. C. Curtis reports two epidemics in the villages of Moravia and Nassau. He emphasizes the filth relations of this disease, the importance of isolation of the cases, and disinfection.

Adulteration of food and drugs has continued to occupy the attention of the board, employing as analysts Drs. Willis G. Tucker, S. A. Lattimore, and G. C. Caldwell, from each of whom is a brief report. "The object has been to select for examination those articles most likely to be adulterated, falsified, or of inferior strength or quality, and by prompt notification sent to the sellers of such to warn them from con-

tinuing their sale, . . . who have, in almost every instance, exhibited a ready willingness to remedy errors and cease the sale of inferior articles." Of 326 samples of *drugs* examined by Dr. Tucker, "there were classed as of good quality, 143, or 43 per cent; fair quality, 44, or 13.5 per cent; inferior quality, 79, or 24.2 per cent; not as called for, 63, or 19.3 per cent. These percentages by no means represent the proportions of good, bad, and indifferent drugs on the market and on sale at the stores, since only those articles which were considered likely to be adulterated or known to be frequently of inferior quality were collected."

Dr. Lattimore's report is limited to *spices, coffee, tea, cream tartar, and kerosene oil*. Of four samples of black pepper examined, three were adulterated; two of white pepper, both adulterated; forty-eight of cream tartar, forty-one adulterated; six of kerosene oil, one only below legal standard. Of the rest, unadulterated.

Dr. Caldwell reports assays of *alkaloid preparations* with tabulated results. "With reference to the genuine preparations, the quality appears, on the whole, to be somewhat better than last year, . . . but a few gross frauds are shown up. The citrate of iron and quinine is often much below the standard called for in the United States Pharmacopœia—12 per cent of quinine—and the quality of the sulphate of quinine used in its manufacture is usually poor."

Cholera is the caption to a special report on the condition of the quarantine and the Health Officer's use of "a most lamentable condition (of things), and in no way fit to receive and properly care for such a number of human beings" as the contingency required. And here follows a description of the lamentable condition somewhat in detail, with which the readers of the *SANITARIAN* are already familiar.

The mortality as summed up from the monthly reports was 96,453, "the percentage of infant mortality being about 37, and in each thousand deaths there were about 225 deaths from zymotic diseases"—7.77 per cent more than in 1886. The average death-ratio per 1000 deaths, from all causes, from zymotic diseases during the past three years, has been 213.48.

The influence of season upon the prevalence of the different zymotic diseases is well shown by tabulated statistics. In the

spring months there were 72.08 less in each 1000 deaths from all causes than the average for the whole year ; 52.60 less in winter ; nine more than in the fall, and 105.71 more in the summer.

Typhoid-fever was slightly more prevalent than during the preceding year, 13.75 against 13.47 per 1000 from all causes ; diphtheria, 67.24 against 64.48 ; *scarlatina*, 13.14 against 11.65 ; *diarrhœal diseases*, 96.00 against 80.67 ; *measles*, 15.60 — “ considerably larger ; ” *whooping-cough*, 4.71 against 14.21 ; *small-pox* existed only in the maritime district, except a limited outbreak in January in Albany, where it reappeared in December, from which there were 175 deaths, and, “ at the time of preparing this report, in January, 1888, cases are being reported beyond the limited centre of the maritime district.” Deaths from *consumption*, 120.35 per 1000 from all causes, against 137.66 in the previous year—nearly 1000 less.

Average death-rate of 87 localities, including all of the 27 cities, except three of the smaller ones, aggregating 3,500,000 population, 23.00 per 1000 ; of 63 localities, ranging in population from 3000 to 13,000, comprising about 375,000, 18.40 per 1000 ; 28.5 per cent of the total returns were under five years of age.

“ Besides the 96,453 deaths noted above, a considerable number of returns are received too late to be included in the monthly issues of the *Bulletin*.”

Official *Bulletin* of the Secretary reports for the month of September, 1888 :

There have been 8433 deaths reported during the month (8267 in September, 1887), representing an annual death-rate per 1000 population of all reporting localities of 20.75. The infant mortality is a little less than that of last month, but is higher than in September, 1887, being 45 per cent of all deaths. From diarrhœal diseases the mortality is much less than in August, but is higher than in the corresponding month of last year, there being a noteworthy continuance of dysentery referred to in the last *Bulletin*. Typhoid-fever caused about the same proportion of deaths as in September, 1887, 3.31 per cent. Diphtheria shows about half the mortality of a year ago. Small-pox developed during the month in the Cattaraugus and Allegany Indian Reservations ; health officers pro-

vided by this board have the disease probably under control, there now being but three cases ; a large number of Indians have been vaccinated. In Buffalo the outbreak of small-pox appears to be checked, and no spread is reported from adjacent towns ; 29.43 per cent of all deaths occurred from zymotic diseases, and 10.61 from consumption (19.65 of deaths above the age of five).

Severally, the populations and death-rates are as follows :

Maritime District.—New York City, 1,526,081, 23.62 ; Brooklyn, 757,755, 23.46 ; Gravesend, 5000, 21.60 ; New Utrecht, 4742, 22.78 ; Long Island City, 21,000, 33.71 ; Newtown, 10,000, 30.00 ; Oyster Bay, 12,000, 8.00 ; Hempstead, 18,000, 18.00 ; North Hempstead, 8000, 12.00 ; Huntington, 8100, 12.00 ; Jamaica, 10,089, 5.94 ; Southold, 7267, 19.84 ; Sag Harbor, 3000, 12.00 ; New Brighton, 15,000, 16.00 ; Edgewater, 12,000, 27.00 ; Northfield, 7014, 13.72 ; Westfield, 7000, 18.85 ; Yonkers, 27,500, 18.43 ; Westchester, 6900, 12.00 ; Sing Sing, 6500, 31.38 ; New Rochelle, 5500, 30.54.

Hudson Valley District.—Albany, 98,000, 20.51 ; Cohoes, 20,000, — ; Troy, 65,000, 29.17 ; West Troy, 13,000, 24.00 ; Hoosick Falls, 6000, — ; Lansingburg, 10,000, 22.80 ; Green Island, 5000, 14.40 ; Greenbush, 8000, 19.50 ; Coxsackie, 4000, 9.00 ; Catskill, 4500, 29.33 ; Hudson, 10,000, 9.60 ; Kingston, 21,000, 21.14 ; Ellenville, 3000, 12.00 ; Marbletown, 4000, 18.00 ; Esopus, 4736, 10.12 ; Saugerties, 4000, 30.00 ; Poughkeepsie, 20,200, 26.73 ; Fishkill, 10,732, 15.56 ; Wappinger Falls, 5000, 12.00 ; Newburg, 20,000, 25.20 ; Port Jervis, 9500, 8.85 ; Middletown, 10,000, 19.20 ; Goshen, 4387, 27.35 ; Ramapo, 5000, 12.00 ; Haverstraw, 7000, —.

Adirondack and Northern District.—Argyle, 3700, 9.73 ; Salem, 3500, 13.71 ; Fort Ann, 4267, 11.25 ; Fort Edward, 4880, 12.24 ; Glens Falls, 10,000, 7.20 ; Crown Point, 4287, 2.80 ; Malone, 9000, 26.66 ; Potsdam, 4000, 24.00 ; Ogdensburg, 11,000, 21.81 ; Gouverneur, 5500, 24.00 ; Plattsburg, 7000, 17.15 ; Watertown, 12,200, 23.60 ; Lowville, 3188, 18.75 ; Clayton, 4314, 25.11 ; Ellisburgh, 4811, 25.00.

Mohawk Valley District.—Schenectady, 20,000, 12.00 ; Schoharie, 3350, 25.07 ; Cobleskill, 3371, 28.46 ; Amsterdam, 14,000, 3.60 ; Johnstown, 6000, 38.00 ; Gloversville, 10,000,

13.20 ; Little Falls, 7200, 16.67 ; Herkimer, 3000, 20.00 ; Ilion, 4200, 20.00 ; Utica, 43,000, 23.60 ; Rome, 12,045, 13.00 ; Boonville, 4000, 21.00 ; Camden, 3400, 17.67 ; Waterford, 5400, 11.11 ; Ballston Spa, 3200, 18.75 ; Saratoga Springs, 10,000, 40.80.

Southern Tier District.—Binghamton, 25,000, 15.60 ; Owego, 6000, 16.00 ; Candor, 4323, 8.30 ; Waverly, 3000, 16.00 ; Hornellsville, 10,000, — ; Elmira, 25,000, 17.76 ; Horseheads, 3500, 20.54 ; Bath, 3500, 24.00 ; Corning, 8000, 21.00 ; Olean, 8000, 21.00 ; Salamanca, 6000, 6.00 ; Jamestown, 14,000, 16.80 ; Westfield, 3000, —.

East Central District.—Walton, 3540, 20.34 ; Delhi, 3000, 4.00 ; Cooperstown, 3000, — ; Oneonta, 7000, 38.57 ; Worcester, 3000, 4.00 ; Cazenovia, 4363, 24.50 ; Brookfield, 3685, ? ; Hamilton, 3912, 3.06 ; Baldwinsville, 3000, — ; Skaneateles, 4866, ? ; Syracuse, 80,000, 17.40 ; Cortland, 9000, 16.00 ; Homer, 3000, 36.00.

West Central District.—Auburn, 26,000, 14.31 ; Ithaca, 10,000, 18.00 ; Groton, 3450, 13.91 ; Waterloo, 4500, 16.00 ; Hector, 5000, 19.20 ; Manchester, 4000, 15.00 ; Phelps, 7000, 20.57 ; Canandaigua, 6300, 11.36 ; Geneva, 6000, 21.00 ; Penn Yan, 4500, 40.00 ; Dansville, 3700, ? ; Batavia, 7000, 7.00 ; Le Roy, 5000, ?.

Lake Ontario and Western District.—Oswego, 24,000, 14.50 ; Richland, 4000, 15.00 ; Fulton, 4000, 12.00 ; Clyde, 3000, 36.00 ; Lyons, 6000, 20.00 ; Newark, 3500, 3.43 ; Palmyra, 4800, 20.00 ; Rochester, 110,000, 12.00 ; Brockport, 4500, 5.33 ; Medina, 4000, 21.00 ; Albion, 5000, 14.40 ; Buffalo, 230,000, 25.90 ; Tonawanda, 4900, 21.60 ; Amherst, 4578, 7.86 ; Lockport, 15,000, 6.40.

Typhoid-fever in Albany.—Dr. E. A. Bartlett, in a report of the Committee on Hygiene, read before the Medical Society of the county of Albany, October 10th, 1888, published in *Albany Medical Annals*, states that “ Not a ward in the city has been free from typhoid and scarlet fevers and diphtheria ; the number of typhoid ranging from 1 case in the sixth ward to 22 cases in the twelfth ward ; of scarlet-fever from 1 in the seventh to 23 in the sixteenth ; of diphtheria from 2 each in the third and sixth wards to 43 in the tenth ward. The wards having the highest aggregate of these three diseases are the

tenth, in which there were 75 cases ; the eleventh, 78 cases ; the seventeenth, 74 cases. Those having the smallest aggregate are the third and fifth wards, in each of which there were 16 cases, and the sixth and seventh, with 9 cases. The month of December, 1887, had the largest aggregate (122) ; September, 1887, had the smallest (16) ; February, 1888, had the greatest number of typhoid (26) ; December of scarlet-fever (50) and diphtheria (52) ; September, 1888, came next, with typhoid (22), diphtheria (40)."

How about the drinking-water ?

NEW JERSEY.—*Hudson County*, 270,232 : Reports for September 479 deaths, of which 239 were under five years of age.

Annual death-rate, 21.3 per 1000. From zymotic diseases there were 133 deaths, and from consumption, 61.

OHIO.—*Second Annual Report of the State Board of Health* for the year ending October 31st, 1887, shows praiseworthy progress in the prosecution of sanitary work, considering the short time since the board has been organized ; but in the introductory pages, under the head of "General Report," seems to have jumped to some conclusions at variance with more substantial information. For example : "Cholera has been arrested at the quarantine station of New York, but it yet remains to be seen whether *the seeds which have been planted there* will all be destroyed." (The italics are ours.) There is not a particle of evidence that any of the seeds of the disease have been planted at the quarantine station of New York ; but, on the contrary, that they were thoroughly destroyed *in limine*. And, again, that "quarantine, as a defence against cholera, has been abandoned by some of the highest sanitary authorities," is equally news to us, unless it means that all mere detention without practical sanitation has been abandoned, but the context does not admit of this meaning. We therefore infer that the "some of the highest sanitary authorities" referred to are certain English reporters and writers who hoodwink superficial inquirers by continually deprecating all quarantines against English commerce, while England herself maintains strict quarantine against the commerce of other nations. Notwithstanding, the soundness of the board on this question may be rightly inferred by the abstract of

Dr. Wise's paper on the subject in our September number. And other reports—On the Adulteration of Food, Drinks, and Drugs, by D. H. Beckwith, M.D. ; Effect of Occupation on the Health of Individuals, by John D. Jones, M.D., and several shorter, though important contributions by other members of the board, and many reports by local health officers in different parts of the State—all go to show that the attention of the board has been chiefly devoted to the primary necessity of practical sanitation at home as the most important and effectual means of protection against infectious diseases from abroad not only, but equally against those of domestic origin.

Of 430 "Reports of Health of Towns," representing 87 counties of the State, 178 towns report epidemics during the year: Measles in 86 places, 42 counties; scarlet-fever in 19 places, 15 counties; typhoid-fever in 21 places, 18 counties; diphtheria in 31 places, 22 counties, and whooping-cough in 9 places, 8 counties. But besides the epidemic prevalence of these diseases, the same were reported in many other places, showing their very general distribution throughout the State. Typhoid-fever, particularly, was reported present in 316 towns and in all counties but two; diphtheria in 250 towns and in all counties but four. But, the Secretary remarks: "While the reports indicate that preventable diseases prevailed to a considerable extent, the amount of sickness, on the whole, has been decidedly less than during the year previous."

Many circulars of inquiry into the conditions of preventable diseases and preventive measures generally were distributed by the Secretary during the year, and considerable practical information gained for future utilization with regard to the water-supply, drainage, sewerage, etc. Meteorological and health charts for Ohio for the year, prepared by E. R. Eggleston, M.D., are instructive and valuable illustrations of the relation of zymotic and pulmonary diseases to meteorological conditions. The proceedings of the State Boards of Health Conference at Washington, 1887, is appended.

Official Monthly Record of 53 localities, comprising a population of 1,071,100, reports the number of deaths for the month of September, 1452, representing an annual death-rate of

16.28. Deaths under five years, 612—42.15 per cent ; 495, or 34.1 per cent, were caused by zymotic diseases, the chief of which were diarrhœal, 226 ; typhoid-fever, 76, and diphtheria, 60. The *highest death-rates* reported were of the small towns—Conneaut, 1500, 56 ; North Amherst, 1600, 45 ; Ashley, 800, 45 ; New London, 1100, 43 ; St. Mary's, 1800, 40 ; McComb, 1400, 34.28. The *lowest death-rates* were in Mansfield, 15,000, 4 ; Shelby, 2500, 4.80 ; Oxford, 2000, 6 ; Versailles, 1900, 6.31 ; Waverly, 1600, 7.50 ; Hamilton, 20,000, 7.80.

Cincinnati, 325,000, 16.08 ; under five years, 167 ; from zymotic diseases, 111—typhoid-fever, 17 ; diphtheria, 23.

Cleveland, 225,000, 23.62 ; under five years, 229 ; from zymotic diseases, 186—typhoid-fever, 21 ; diphtheria, 20.

Columbus, 92,000, 16.90 ; under five years, 46 ; from zymotic diseases, 45—typhoid-fever, 18 ; diphtheria, 2.

Toledo, 80,000, 10.95 ; under five years, 30 ; from zymotic diseases, 21—typhoid-fever, 3.

Dayton, 52,000, 9.92 ; under five years, 14 ; from zymotic diseases, 5 ; typhoid-fever, 3.

PENNSYLVANIA.—*Second Annual Report of the State Board of Health and Vital Statistics* for the year ending October 1st, 1886. A ponderous volume of 1056 pages with numerous diagrams and charts, bearing evidence of a great deal of work collectively and severally by the members of the board and those in its employ.

The division of labor is indicated in the usual manner by standing committees on subjects of primary importance, and under these headings every member of the Board is a contributor. The foremost of these committee reports—in relative importance (without regard to the order of enumeration)—is on water-supply, drainage, sewerage, topography, and mines—Rudolph Herring, C.E., Chairman. The water-supply of the cities and boroughs in the State, when built, sources, modes, etc., is tabulated. A concise description of existing defects and necessities with regard to *quantity*, particularly of the Philadelphia supply, follows, but surprisingly little is said of the *quality*.

Water analysis seems not to have engaged the attention of

the committee or of the board. Possibly the description of the foul soil, foul streams, organic impurities, sewage, privy vaults, etc., and the resulting prevalence of typhoid-fever and other filth diseases were deemed to be sufficiently suggestive without analysis; and, in relative value, rightly so. But a special report on the *Quality of the Water-Supply of Philadelphia as Tested by Vital Statistics*, by Richard A. Cleeman, M.D., Member of the Board of Health of Philadelphia, opposes any such conclusion and contends for the wholesomeness of the waters of the Schuylkill, notwithstanding that "in addition to the pollution of its waters in its upper portion, with a total drainage area of 18,639 square miles, it receives in a distance of 60 miles, from Reading to Fairmount Dam, the water-closet drainage of a population of 22,000 souls and the waste-water drainage of 63,000, besides the refuse from scores of manufactories, drainage from cemeteries, and the like," as shown by surveys made under the direction of Colonel William Ludlow, late Chief of the Water Department of Philadelphia—notwithstanding all this, plus the analyses of Drs. Charles M. Cresson, Albert R. Leeds, and others, demonstrating the impurities present, Dr. Cleeman attempts to show by an array of statistics that such moderately diluted sewage as that which flows down the Schuylkill and drunk by the people of Philadelphia is not unwholesome!

Per contra, the valuable contribution of Dr. Charles Smart, Surgeon and Major of the United States Army, conclusively shows the relation of typhoid-fever to polluted water by sewage generally, and that in an estimate of the death-rate from that disease per 100,000 of the population of Philadelphia compared with the unsewered cities of Baltimore and New Orleans. The rates were for the decade 1866-75: Philadelphia, 55.8; Baltimore, 78.3; New Orleans, 41.3. Decade 1876-85: Philadelphia, 66.1; Baltimore, 52.5; New Orleans, 24.6.

The example is the more striking when it is considered that the drinking-water of New Orleans is rain-water, collected in cisterns—the Mississippi water is used only for flushing the street gutters, etc.

The comparison of Philadelphia's rate with other cities is equally unfavorable to her.

Reports on the sanitary condition of cities and towns, and on epidemics of typhoid-fever, by the Secretary, Dr. Benjamin Lee, by the different members and inspectors of the board, and by local health officers throughout the State, show the common prevalence of typhoid-fever and other intestinal diseases consequent upon polluted drinking-water, and that it is the most important question with which the board has to deal.

The Geographical Distribution of Consumption of the Lungs and Malarial Disease in the State, by William Pepper, M.D., LL.D., etc., is one of the most important and instructive reports in the volume. It is illustrated with maps showing the relation of pine and hemlock areas, elevations, rainfall, and temperature ; gives statistics of race and occupation ; relation of winds and special exposures ; proportion of deaths from consumption to other diseases in Philadelphia ; comparative rates with other populations, etc., aggregating a large amount of practical information of great utility, and eminently worthy of the widest possible circulation. This and the report of Dr. Smart, before referred to, the address of the late Erastus Brooks before the Sanitary Convention on "What the State Owes to the People and the People to the State," other committee reports of the board, the inspector's reports on typhoid-fever, slaughter-houses, piggeries, stables, etc., and especially the Secretary's investigations and reports upon the sources of typhoid-fever and diphtheria at a number of localities—all contribute to make the volume one of unusual value for circulation among the people.

Philadelphia, 1,016,758 : Reports for five weeks ending September 29th, 1888, 1733 deaths, of which 687 were under five years of age. Annual death-rate per 1000, 17.80. From zymotic causes there were 348 deaths, and from consumption, 207.

With regard to *typhoid-fever*, the *Medical Times* of November 1st says :

"Philadelphia still stands at the head of American cities as to the number of cases of typhoid-fever developing, the average record of deaths from this disease for the last three weeks being twenty-three. We do not see how this can be fairly attributed to bad drinking-water. Were either the Schuylkill or the Delaware River infected with Klebs's bacilli, the num-

ber of cases would be enormously greater, judging by the Plymouth epidemic. The cause is rather to be sought in our sewers, badly planned, dishonestly constructed, and ignoring the fundamental laws of physics in not being properly ventilated. Typhoid stools, thrown into a closet, may infect the sewer which drains a whole street, or even a series of streets. A little care on the part of the physician, in directing the stools to be disinfected previous to emptying them into the water-closet, would prevent the mischief. It is easier to disinfect a little sewage than a whole mile of sewer.

“The water supplied to Philadelphia would not be considered objectionable by many other cities. Still, it is not good enough if better can be procured, and this is the case. The city is wealthy enough to bring a plentiful supply of the pure water of the Delaware from above Trenton, and this must eventually be done. The cost of such an aqueduct would not be very great for a city of over a million inhabitants, and would prove profitable as an investment. It pays a city to have a low death-rate, as there is a large floating population of people of means, who are free to live where they like, and are apt to choose the healthiest place for their residence.”

We are gratified to learn, and hope it is true, that the city authorities of Philadelphia have under consideration means for purifying the water-supply. That the sewers of the city and the condition of the house connections therewith, generally, are execrable and equally, if not indeed even more promotive of typhoid-fever throughout the city than the water-supply may be true, but this is only so much more to the shame and disgrace of the people who submit to such unhealthful conditions.

Pittsburgh, 230,000 : Reports for three weeks ending September 15th, 234 deaths, of which 110 were under five years of age. Annual rate of mortality, 17.5 per 1000. From zymotic diseases there were 45 deaths, and from consumption, 14.

RHODE ISLAND.—*Providence*, Dr. E. M. Snow, City Registrar, reports for the year 1887 : Population, 121,500 ; births, 2963—1 in 41.01, or 24.39 per 1000 ; marriages, 2568—1 in 47.31, or 21.14 per 1000 ; deaths, 2612—1 in 46.52, or 21.50

per 1000 ; 896, or 34.30 per cent of the total number of deaths, were under five years of age. The report is almost wholly statistical, but very comprehensive, giving the races, nationalities, sexes, and ages in detail, seasons and comparative results for thirty-two years.

The rate of mortality in 1887 was higher by 1.88 than in 1886. During the thirty-two years previous to 1887, the average annual rate of mortality was one death in 51.10 of the population. Deaths from *consumption* in 1887, 314—12.05 per cent of total—4.18 per cent less than the average for thirty-two years. From *diphtheria* in 1887, 109—4.18 per cent—60 per cent more than the average for thirty years. From *croup* in 1887, 39—1.49 per cent—55 per cent less than the average for thirty-two years—a difference probably due to the recognition of "croup" by most physicians in recent years as diphtheria. From *typhoid-fever* in 1887, 39—1.49 per cent—1.64 per cent less than the average for thirty-two years. These figures, compiled by one of the most careful and experienced observers, illustrate important advances in life-saving under the progress of practical sanitation.

WISCONSIN.—*Milwaukee*, 195,000 : Reports for the month of September 310 deaths, of which 104 were under five years of age. Annual death-rate per 1000, 19.1. From zymotic diseases there were 100 deaths, and from consumption, 19.

SMALL-POX.—Deaths reported from this disease abroad, at the most recent dates, as follows : Four weeks ending September 29th : Ostende, 2 ; Quaregnon, 18 ; Hull, 2 ; Paris, 8 ; Amiens, 6 ; Marseilles, 4 ; Havre, 1 ; Cologne, 1 ; Berlin, 8 ; Prague, 37 ; Chemnitz, 1 ; Strasburgh, 1 ; Dresden, 1 ; Trieste, 23 ; Vienna, 2 ; Warsaw, 18 ; Bucharest, 2. During the month of August : Genoa, 4 ; Barcelona, 17 ; Nantes, 3 ; Rouen, 1. During the month of July : Buenos Ayres, 63.

HAVANA.—Dr. D. M. Burgess, Sanitary Inspector at Havana, reports to the Marine Hospital Service, October : "Small-pox, which for over fifteen months reigned here in an active epidemic form, seems to have nearly or quite disappeared for the present, from Havana, its suburbs, and the province of that name, as there has not been a death from it for the last fifty days or more ; however, in some of the out-

lying towns, as Matanzas, Guines, and Manzanillo, it still exists."

THE PROPORTION OF THE INSANE TO POPULATION IN THE UNITED STATES is, in the New England States, 1 to every 359; in the seaboard States, 1 to every 610, and in the extreme Southern States, 1 to every 935. Westerly from the New England States, the rate decreases, and in the newer States and far western territories is only 1 to every 1263 inhabitants.

ALCOHOLISM AND CRIMINALITY.—M. Maranhat in a recent communication to the Academy of Medicine, Paris, sums up the pernicious influence of alcohol as follows: Of 3000 condemned persons, he found that of vagabonds and beggars there were 79 per cent who were confirmed drunkards; that of assassins and incendiaries there were from 50 to 57 per cent; those convicted of indecent assault, 53 per cent; thieves, swindlers, etc., 71 per cent; and, finally, in acts of violence on persons there were 88 per cent drunkards and 79 per cent in acts of violence on property. Among youths under twenty years of age drunkards are nearly in as great number as adults, the difference being only 10 per cent. He observes that there is here an indication of the starting-point of the passion for drinking, and as of a hundred young persons not having as yet attained the age of twenty years 64 per cent are already given to drink, it is evident that it is on the side of the child by an education and by special measures that the evil must be attacked. The classification of the departments, as given by M. Maranhat, confirms the assertions of the late Dr. Lunier, on the great number of drunkards which exist in the departments where, owing to the absence of the cultivation of the vine, alcohols of industry are consumed in much greater quantity.—Paris letter in the *Medical Record*, July 21st, 1888.

SCHOOL OF HYGIENE AT ROME.—Sanitary science is beginning to be cultivated in earnest in Italy. A school of hygiene has been established in connection with the Institute of Experimental Hygiene in Rome. Instruction in matters relating to public health and sanitary engineering will be given to medical men, engineers, veterinary surgeons, and pharmacists,

and the technical researches on subjects relating to sanitation, ordered by the Italian Board of Public Health, will be carried out. The course will include practical exercises in physical and microscopical investigation, and chemical analysis as applied to hygiene. A certificate will be given after due examination to those who have gone through the whole course. Professor Pagliani, Ordinary Professor of Hygiene in the University of Turin, has been appointed director of the school, in which he will also fill the Chair of Sanitary Engineering.—*British Medical Journal*.

AMERICAN MEDICAL ASSOCIATION.—The Fortieth Annual Meeting of this Association will be held at Newport, R. I., on Tuesday, June 25th, 1889, instead of the *first* Tuesday in June, as appointed at the meeting in Cincinnati, for the reasons previously mentioned in the *Journal*. Next year will also be the two hundred and fiftieth anniversary of the settlement of Newport, and all circumstances favor a meeting of the association of unusual interest. The Rhode Island State Society is cordially co-operating with the Local Committee of Arrangements. We are informed that acceptances have been received from each of the gentlemen elected to deliver the general addresses at the meeting in Newport. The Address in Medicine will be given by Professor William Pepper, of Philadelphia; the Address in Surgery, by Professor P. S. Connor, of Cincinnati; and the Address in State Medicine, by Professor W. H. Welch, of Baltimore.

The following constitute the Local Committee of Arrangements: H. R. Storer, Chairman; W. Thornton Parker, Secretary; C. F. Barker, M. E. Baldwin, C. A. Brackett, J. P. Curley, P. F. Curley, J. P. Donovan, H. Ecroyd, Jr., V. M. Francis, T. A. Kenefick, G. M. Odell, F. H. Rankin, W. C. Rives, Jr., S. H. Sears, W. S. Sherman, H. E. Turner.

Associate Committee, appointed by the Rhode Island Medical Society, G. D. Hersey, W. H. Palmer, G. T. Swarts, all of Providence.

REWARDS FOR MERITORIOUS DISCOVERIES AND INVENTIONS.—*The Committee on Science and the Arts of the Franklin Institute* of the State of Pennsylvania is empowered to award, or to recommend the award of, certain medals for meritorious

discoveries and inventions which tend to the progress of the arts and manufactures.

These medals are :

1. *The Elliott Cresson Medal* (gold).—This medal was founded by the legacy of Elliott Cresson, of Philadelphia, and conveyed to trustees of the Franklin Institute. By the act of the institution, May 17th, 1849, the Committee on Science and the Arts was designated and empowered to award this medal, and the committee decided to grant it, after proper investigation and report by sub-committee, either for some discovery in the arts and sciences, or for the invention or improvement of some useful machine, or for some new process, or combination of materials in manufactures, or for ingenuity, skill, or perfection in workmanship.

2. *The John Scott Legacy Premium and Medal* (twenty dollars and a medal of copper) was founded in 1816 by John Scott, a merchant of Edinburgh, Scotland, who bequeathed to the city of Philadelphia a considerable sum of money, the interest of which should be devoted to rewarding ingenious men and women who make useful inventions. The premium is not to exceed twenty dollars, and the medal is to be of copper, and inscribed "*To the most deserving.*"

The control of the Scott Legacy Premium and Medal (by Act of 1869) was transferred to the Board of Directors of City Trusts, and referred by the board to its Committee on Minor Trusts, and that committee resolved that it would receive favorably the name of any person whom the Franklin Institute may from time to time report to the Committee on Minor Trusts as worthy to receive the Scott Legacy Premium and Medal.

The Franklin Institute, by resolution in 1882, accepted the above-named action of the Committee on Minor Trusts, and referred the duty of making such recommendations to the Committee on Science and the Arts. The committee determined that the recommendation for such reward shall be made on the favorable report of a sub-committee which shall be appointed to examine the invention or discovery.

Upon request therefor, from interested parties, made to *William H. Wahl*, Secretary of the Franklin Institute, Philadelphia, Pa., full information will be sent respecting the man-

ner of making application for the investigation of inventions and discoveries ; furthermore, the Committee on Science and the Arts will receive and give respectful consideration to reports upon discoveries and inventions which may be sent to it with the view of receiving one or the other of the awards herein named, and full directions as to the manner and form in which such communications should properly be made will be sent on application.

ANTHROPOLOGICAL INSTITUTE.—Three scientific societies will hold sessions in Paris during the Exposition of 1889. These have been classed by Braca under the general head of Anthropological Institute. They will be subdivided into the following departments : First. Anthropological Societies and their Teachings ; Second. Anthropological Anatomy and Physiology ; Third. Paleontology or Prehistoric Remains ; Fourth. Ethnology, Ethnography, and Sociology ; Fifth. Religious Science and Mythology ; Sixth. Linguistics and Popular Traditions ; Seventh. Comparative Arts ; Eighth. Medical Geography ; Ninth. Anthropology, Judicial and Criminal ; Tenth. Demography. Dr. Letourneau, Secretary.

LITERARY NOTICES.

DISINFECTION AND DISINFECTANTS.—The American Public Health Association has recently published a book of great value to physicians and sanitarians. It is the report of a committee appointed by this association to determine by experimental work and thorough investigation the value of disinfectants in the prevention and treatment of disease. The committee appears to have been chosen with special reference to recognized competency and the comprehension of excellent opportunities for the execution of the work to which they were appointed, as follows : George M. Sternberg, M.D., Surgeon of the United States Army, and Fellow by Courtesy in the Johns Hopkins University ; Joseph H. Raymond, M.D., Professor of Physiology and Sanitary Science in Long

Island College Hospital; Victor C. Vaughan, M.D., Ph.D., Professor of Physiological Chemistry in the University of Michigan, and member of the Michigan State Board of Health; Charles Smart, M.D., Surgeon of the United States Army, and member of the National Board of Health; George H. Rohé, M.D., Professor of Hygiene in the College of Physicians and Surgeons, Baltimore; Joseph Holt, M.D., President of the Louisiana State Board of Health; Samuel H. Durgin, M.D., Health Officer of Boston; and J. R. Durgan, M.D.

The original experimental investigations made by the committee are of great importance and value in demonstrating the efficacy of disinfectants and their special adaptations to the material to be disinfected. A large amount of original work is devoted to the various micro-organisms and in determining the worthlessness of many of the so-called disinfectants and germicides. On the efficiency of *steam* as a disinfectant, under the head of "Moist Heat" (p. 80), Dr. Sternberg reports that in it, "at a temperature of from 105° to 110° C. (221° to 230° F.), we have an agent which quickly destroys all living organisms, including the most refractory spores. . . . From the experimental evidence presented, it is safe to say that the temperature of boiling water will quickly destroy the vitality of all micro-organisms of the class to which known disease germs belong, in the absence of spores.

"Steam at a temperature of 110° C. (230° F.) maintained for one or two minutes, or of 105° C. (221° F.) maintained for ten minutes, will infallibly destroy the spores of all bacilli, which constitute the most difficult test of disinfecting power known." The practical application of steam is very fully illustrated with cuts of the different apparatus devised for the purpose. No notice is taken, however, of its application to the hold and bilge of infected vessels by means of hose, with which the readers of the *SANITARIAN* are familiar.

The biological work was conducted mostly at the Johns Hopkins University under the supervision of Dr. Sternberg, and at the University of Michigan under Dr. Vaughan. Various apparatus used for disinfecting purposes, as well as the admirable quarantine system at New Orleans, are fully described and illustrated. The chapter on Ptomaines, by Dr.

Vaughan, is of great value, showing their danger and how they may be avoided.

The labors and investigations of the committee extended over a period of three years, and no expense has been spared to make it the most complete work on the subjects of which it treats hitherto published.

The volume consists of 265 pages, with 68 illustrations, printed upon heavy paper, and is elegantly bound in handsome cloth. The price has been fixed at the low price of \$2. It will be sent postpaid on receipt of the price. Address :

Irving A. Watson, M.D., Secretary American Public Health Association, Concord, N. H.

ANNUAL OF THE UNIVERSAL MEDICAL SCIENCES : A YEARLY REPORT OF THE PROGRESS OF THE GENERAL SANITARY SCIENCES THROUGHOUT THE WORLD. Edited by Charles E. Sajous, M.D., and seventy associate editors, assisted by over two hundred corresponding editors, collaborators, and correspondents. Illustrated with chromo-lithographs, engravings, and maps. Five volumes of 550 pages each. Philadelphia and London : F. A. Davis. This is the most comprehensive work of medical progress published during the current year. It is the successful first year's result of a great undertaking to supply the medical practitioner with the *gist* of medical *progress*, carefully collated, digested, and classified ; insomuch as to make it a ready reference book in every department of preventive and curative medicine. It would be too much to expect of a work of this magnitude, *annually*, to commend itself in all respects to the critical reader. But whatever its shortcomings may be in this particular, there are few medical practitioners who do not frequently find it necessary to seek knowledge in addition to all that is accessible in standard treatises, however modern. For those who would be abreast with progress and avail themselves of the most recent additions to their resources, we commend the work before us for its superiority over any other that has fallen under our observation.

THE SATELLITE OF THE ANNUAL OF THE UNIVERSAL MEDICAL SCIENCES is a quarterly review of the most important articles appearing in the medical press at large. Edited by

Charles E. Sajous, M.D. Published in connection with the annual, and for its subscribers only, at \$15 per annum. Philadelphia : F. A. Davis.

PHOTOGRAPHIC ILLUSTRATIONS OF SKIN DISEASES : AN ATLAS AND TEXT-BOOK COMBINED. By GEORGE HENRY FOX, A.M., M.D., Clinical Professor of Diseases of the Skin, College of Physicians and Surgeons, New York ; Professor of Diseases of the Skin, Post-Graduate Medical School and Hospital, New York ; Physician to the New York Skin and Cancer Hospital ; Fellow of American Academy of Medicine ; Member of the New York Dermatological Society, the American Dermatological Association, etc. Second Series, complete in twelve parts. Hand-colored plates ; nearly one hundred cases from life. 4to. To be published in twelve monthly parts, \$2 each. New York : E. B. Treat.

Parts 7 and 8 of this work have nine colored plates, and treat of (7) porrigo, erysipelas, pemphigus, furunculus, carbunculus, ulcus, acne, onychia, hemorrhagic affections, and hypertrophic diseases ; (8) clavus, verruca, cornua, kerotosis, molluscum, ichthyosis, elephantiasis, morphœa, rosacea, and hypertrichosis. The excellence of the illustrations and completeness of text upon which we have remarked with reference to the preceding parts are fully maintained in those now before us ; the work is alike commendable as a hand-book to the medical practitioner and text-book for the student.

PHYSICIAN'S INTERPRETER IN FOUR LANGUAGES, SPECIALLY ARRANGED FOR DIAGNOSIS. By M. VON V. Price, \$1. F. A. Davis, 1231 Filbert Street, Philadelphia, publisher.

This is a handsome little pocket-book, well calculated to be of great utility to physicians not otherwise able to converse in English, French, German, and Italian. The questions are systematically arranged with reference to the various branches of practical medicine, and so worded that the only reply required of the patient is merely yes or no. For ready reference the questions are numbered, and a complete index renders them quickly available for the special subject of inquiry.

FIFTH ANNUAL REPORT OF THE BUREAU OF STATISTICS OF LABOR OF THE STATE OF NEW YORK FOR THE YEAR 1887.

Pp. 792. This is a very comprehensive report, treating very fully of strikes, of which the Commissioner remarks with reference to previous inquiries :

“ My experience is and has been more than doubly verified by the personal experience I have lately gone through with, *that a large majority of the strikes engaged in occur wholly through ignorance.*” The report is very largely devoted to an investigation of the causes and consequences of the strikes during the year 1887. There are special articles on the coal and 'longshoremen's strikes, which formed the subject of legislative investigation. The trade disturbances of 1887 are said to have been more numerous than during the preceding year, though less important. But the persistent strikes, the labor organizations, and the repeated interruptions to money-making and quiet capitalistic investment have compelled attention to the laborers' wants and claims ; and for a knowledge of the relations of employers and employés, the volume before us is a source of well-arranged information by which all may profit. Over three fifths of the volume are devoted to this subject. Boycotts, early closing and holidays, conspiracy prosecutions and conspiracy laws, and an Appendix comprehending the Labor Laws of 1886 and 1887 occupy the remainder.

AN INTRODUCTION TO ENTOMOLOGY. By JOHN HENRY COMSTOCK, Professor of Entomology and General Invertebrate Zoology in Cornell University, with many original illustrations, drawn and engraved by Anna Botsford Comstock. Part I. Price, \$2. Ithaca, N. Y. Published by the author. This work, we are told prefatorily, has been prepared to meet the demand for a text-book which shall enable students to acquire a thorough knowledge of the elementary principles of entomology, and to classify insects by means of analytical keys similar to those used in botany. That it will eminently fulfil its object is manifest by the conciseness and lucidity of the text and paper, so well adapted to the superior excellence of the illustrations.

THE AMERICAN JOURNAL OF PSYCHOLOGY. Edited by G. STANLEY HALL, Professor of Psychology and Pedagogics,

Johns Hopkins University, Baltimore, Md. Quarterly, \$3 a year. This is a new periodical to be conducted on strictly scientific principles, and well calculated to gain the support of a class of contributors and readers who have hitherto had no organ in this department of current literature. It will doubtless commend itself to the teachers of psychology in the higher institutions of learning, generally, to biologists, anthropologists, and physiologists—especially to neurologists—as a special means of concentrating thought and eliminating the certainties of experimental knowledge from speculative theories.

WATER: ITS IMPURITIES GATHERED FROM THE AIR AND EARTH. By C. W. MOORE, M.D. Reprint from the "Pacific Record of Medicine and Surgery," San Francisco, Cal. A pamphlet of eighty pages, comprising a great deal of useful information, mostly compiled from recent studies of the relation of water to health, the means of detecting impurities in it, and the importance of avoiding them. It is a health tract of much value, and eminently worthy of a wide circulation.

THE "NATIONAL TEMPERANCE ALMANAC AND TEETOTALER'S YEAR-BOOK FOR 1889" has just been issued by the National Temperance Society. It contains the latest official statistics of the drink traffic, internal revenue returns, United States standing army of liquor dealers, beer and liquor statistics, death-rate and intoxicating liquors, high license, a full list of temperance periodicals, State Good Templars, Sons of Temperance, Temples of Honor, Woman's Christian Temperance Unions, etc., together with a list of the various temperance organizations in New York City and Brooklyn. It also contains twenty fine wood-engravings, with choice stories, including shadow pictures by Edward Carswell and Frank Beard, "The Devil's Orchard," "Fall of the Grape," etc. No better pocket companion for the friends of temperance was ever issued. Invaluable to every temperance worker. Price, only 10 cents; \$1 per dozen. Send for it.

Address J. N. Stearns, 58 Reade Street, New York.

"MISS PARLOA'S NEW COOK-BOOK," published by Estes & Lauriat, Boston, Mass., is an attractive novelty in both style

and substance. It is the evident work of a *mistress* in the art of cooking, and it is difficult to conceive how this art can be made more easy and elegant than by following the directions of this book for the preparation and cooking of almost every variety of food common to civilized life.

THE SLÖJD IN THE SERVICE OF THE SCHOOL. By OTTO SALOMON, Ph.D., translated by William H. Carpenter, Ph.D., of Columbia College, a monograph of twenty-five pages, is a valuable contribution to, and should be read by everybody interested in, the subject of industrial education. Price, 20 cents. Monographs, issued bi-monthly, \$1 a year. Leaflets, issued every two weeks, 50 cents a year. Industrial Education Association, New York.

UNIVERSITY MEDICAL MAGAZINE is a new medical monthly under the auspices of the alumni and faculty of medicine of the University of Pennsylvania, with an editorial staff as follows : Advisory Committee : William Pepper, M.D.; D. Hayes Agnew, M.D.; William Goodell, M.D.; James Tyson, M.D.; William Osler, M.D.; J. William White, M.D.; S. D. Risley, M.D.; R. S. Huidekoper, M.D., V.S.; Horace Jayne, M.D. Editorial Committee : G. E. De Swheveinitz, M.D.; Hobert A. Hare, M.D. An abundant guaranty, surely, of the ability with which it will be conducted. The table of contents embraces "Original Articles, Memoranda, Laboratory Notes, Department Notes, Editorial, Society Proceedings, Book Notices, Miscellaneous." The publisher is A. L. Hummel. \$2 a year.

MARITIME MEDICAL NEWS, a quarto-shaped bi-monthly, \$1 a year, Halifax, N. S., and

THE OMAHO CLINIC, also quarto, \$1 a year, compare favorably with the large number of "dollar journals," and will doubtless win, as they deserve, the support of a reading profession and an advertising patronage.

MEDICAL EXCERPT.

THE TREATMENT OF SLEEPLESSNESS.—A sufferer from this uncomfortable symptom has found the following to be an effectual remedy in his own case. After taking a deep inspiration, he holds his breath till discomfort is felt, then repeats the process a second and a third time. As a rule, this is enough to produce sleep. A slight degree of asphyxia is thus relied on as a soporific agent, but the theoretical correctness of this method is somewhat open to question. Certainly there is proof that the daily expenditure of oxygen is most active during the waking period, and that nightly sleep appears to coincide with a period of deficient tissue oxygenation. It is at least as probable, however, that other influences are associated with the production and timely recurrence of sleep besides that just referred to. This plan, moreover, however effectual and beneficial in the case of its author, is not without its disadvantages. The tendency of deficient oxygenation is to increase blood-pressure and to slow the heart's action. With a normal organ, as an occasional occurrence, this might not be of much consequence. If, however, the impeded heart should also be enfeebled by disease, the experiment might be repeated once too often.—*Lancet*.

THE POISONOUS EFFECT OF CIGARETTE-SMOKING.—Once more the subject of cigarette-smoking and its effect are made the subject of elaborated experiment. Dr. William L. Dudley (*Medical News*, September 5th, 1888) has made careful test with cigarettes, cigars, and pipes, and from the study on the lower animals concludes that the poisonous effect of the cigarette smoke when inhaled is the principal cause of the poisonous result. He thinks that inhaling smoke from a pipe or cigar would produce exactly the same injurious results. The poisonous element in the smoke is the carbon monoxide which is so extremely poisonous because it has such a strong affinity for the hæmoglobin of the blood. This seems to be the clearest piece of work on cigarette-smoking yet brought

before the public, and may help many a physician to explain to fond parents and interrogating sons exactly why cigarette-smoking is harmful, without blaming the brand of cigarette. Dr. Dudley's conclusions, as drawn from his experiments, are as follows :

1. That carbonic oxide is the most poisonous constituent of tobacco smoke.

2. That more injury results from cigarette than cigar or pipe smoking, because, as a rule, the smoke of the former is inhaled.

3. That cigarette-smoking without inhaling is no more injurious than pipe or cigar smoking.

4. That the smoke of a cigar or pipe, if inhaled, is as injurious as cigarette smoke inhaled.

5. That the smoke from a Turkish pipe, if inhaled, is as injurious as that of a cigarette inhaled.—*Maryland Medical Journal*.

DIPHENYLMETHYLPYRAZOL—A NEW ANTIPYRETIC.—The aniline works of Hoechst, on the Rhine, formerly Meister, Lucius & Bruening, have secured a patent on a new antipyretic, which has a composition similar to that of antipyrin, and which is designated as *diphenylmethylpyrazol*, or, shorter, *diphenylpyrazol*.

The new substance is prepared by a process very much resembling that by which antipyrin is made.

It is reported to appear in form of white needles, difficultly soluble in water, ether, or petroleum ether, but easily in alcohol or glacial acetic acid. It differs from antipyrin by possessing a pronounced basic character. With nitric acid and ferric chloride, it reacts similarly to, but much more faintly than antipyrin.—After *Zeitsch. f. angew. Chem*.

SODA AND LIME IN WATER.—O. Binder's Method (*Ztsch-f-Anal.-Chem.*) for estimating the quantities of soda and lime necessary for the purification of water is by direct titration, and is as follows : To 200 c. c. of the water, in a flask of 300 c. c. capacity is added 50 to 75 c. c. of lime water of known strength, and warmed at a temperature desired for purification (50 to 80° C.). The contents of the flask are then cooled and

the flask filled up to the mark with distilled water free from carbonic acid ; 250 c. c. are filtered through a dry filter, the excess of lime titrated, and the quantity of lime necessary for one litre is calculated. For soda, 250 to 300 c. c. of the water are evaporated in a platinum dish with 5 c. c. normal soda solution, the residue dissolved in water, filtered, washed, the carbonate of soda estimated by acid and methyl orange, and find by calculation the quantity of soda necessary for chlorides, nitrates, sulphates, etc.—*Ztsch. Nahr. Unt. & Hyg.*

THE DETECTION OF COTTON-SEED OIL IN LARD.—M. Conroy employs a modification of Milliau's silver nitrate test. Make a test solution containing five parts silver nitrate and one part nitric acid (sp. g. 1.42) in one hundred parts rectified spirits (sp. g. 0.838). Twenty grain measures of this solution are added to 100 grains of lard in a test tube, previously melted on a water bath, and kept in boiling water for five minutes. Pure lard remains white, but if adulterated with cotton-seed oil it becomes more or less olive brown in color, according to the proportion of adulterant present.

THE DETECTION OF LARD IN COTTON-SEED OIL will probably be in order ere long, inasmuch as *Cotton-Seed Oil Lard* is among the new products on the market, and with strong claims to superiority to hogs' lard in both purity and wholesomeness. Indeed, since the extended manufacture of oleomargarine, hogs' lard generally appears to have yielded up the good qualities which formerly characterized it. It is, in short, very commonly adulterated by the deprivation of its most essential qualities.

PAPINE is recommended by Dr. Charles H. Merz, the house physician to University Hospital at Cleveland, O., as a most agreeable substitute for morphine and opium. It is the anodyne *par excellence*.

DELICATE TEST FOR SACCHARINE.—The most delicate test for saccharine so far known is that discovered by Ira Remsen.

A minute quantity of saccharine is mixed with a little excess of resorcin and a few drops of sulphuric acid in a test tube.

On heating, the mass turns yellow, red, then dark green, gives out a large amount of sulphurous acid, and swells up. The heat is then withdrawn for a short time, but reapplied again two or three times, so that the mass may swell up during each heat. It is then allowed to cool, diluted with water and supersaturated with an alkali. The resulting solution will have a reddish tint by transmitted light, and a strongly green fluorescence by reflected light. This reaction permits the detection of 0.001 Gm. (ab. $\frac{1}{64}$ grain) of saccharine in five or six quarts of liquid.

In order to separate the saccharine from articles of food, or drink, or medicinal mixtures, an excess of acid must be used, as the saccharine is present in form of a soluble alkali salt. Solid and difficultly soluble substances are powdered, moistened with a few cubic centimetres of dilute sulphuric or phosphoric acid, then dried and exhausted with ether. Wines and other similar liquids are acidulated and shaken at least twice with an equal volume of ether during one hour. If fats are present, these are removed, previous to acidulation, by means of petroleum ether.—After *American Chemical Journal*. [The residue left by the ethereal solution, if not sufficiently pure, may be got into aqueous solution by means of a dilute alkali, the solution filtered, if necessary, and the saccharine separated by an acid and by ether as before.]

ANTIPYRIN IN WHOOPING-COUGH.—Dr. Sonnenberger, of Worms, has drawn attention in the early part of this year to the remarkably beneficial effects of antipyrin as a remedy in whooping-cough. This announcement was made almost with reluctance, since antipyrin had already been blazoned forth almost as a cure-all, and it was known beforehand that any fresh announcements of new channels of its usefulness would be probably received with a shrug of the shoulder. And yet there seems to be no doubt now but that this remedy is one of the most reliable ones in the disease mentioned. This is not the place for an article on medical therapeutics, and those who wish to learn all the details of treatment and the mode of using the remedy should consult the author's original paper. But for the information of our readers, it may be stated that the author reports it to have the best effects when

given as early in the disease as possible. If given in time, it causes the disease to "abort," so as to appear only as a mild bronchial catarrh. But even when administered in a subsequent stadium, it will quickly reduce the attack to a mild grade.—*American Druggist*.

THE ADULTERATION OF SHERRY.—In the last issue of the United States Consular Reports, the Consuls at Cadiz and Jerez de la Frontera return to the subject of the adulteration of sherry, on which they reported most unfavorably. Mr. Ingraham, of Cadiz, sends a translation of a circular from the Spanish Minister of the Interior to the civil governors of the provinces, directing prosecutions against the makers and vendors of adulterated wines, in accordance with a royal decree against adulteration. Adulterated wines are thus defined in the decree: Natural wines which contain (1) Impure industrial alcohol and alcohol from husks (*cascara*), if they are not rectified and purified. (2) Salicylic acid and other antiseptic substances. (3) Foreign coloring substances, those derived from the products of pit coal (*sic*), as well as of vegetable or other origin. (4) Artificial glucose, sugar from flour, or new wine. (5) Glycerine. In a report on the trade in sherry for last year, Mr. Ingraham says: "Old houses admit that the demand for low-priced wines compels them to yield reluctantly and compete for the market by using Berlin spirits for rectification at one half the cost of Spanish grape alcohol, which is sold at £25 to £30 a butt, according to vintage, while German alcohol is selling at £13 a butt under sharp competition and on long credit." Eleven thousand butts of this spirit were imported into Cadiz in 1886, and consumed in the province, the total average vintage of which was seventy-five thousand butts. The Mayor of Jerez declares that all the misfortunes of the wine-growers arise from the use of the industrial spirits; that the cellars are "mysterious laboratories, whose secrets no one is allowed to penetrate," and that the spurious usurps the genuine wines. It is said that only four gallons of spirit are used in a butt of wine, but the proportion of import to the vintage is as eleven to seventy-five, and Cadiz only imports about one twentieth of that annually imported into Spain.—*After J. S. Chem. Ind.*



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